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COMPUTERWORLD

PC pricing could spur shakeout

Bad news for smaller players as corporate users return to big vendors

BY CAROL HILDEBRAND
CW STAFF

Third-tier clone makers can kiss the corporate customer goodbye, users and analysts said last week, citing fallout from the recent price blitzkrieg from Compaq Computer Corp. and competing vendors.

"Why would you pick a Most Blessed Happiness box from Taiwan when you can get a Dell for the same price?" said Richard Shaffer, a principal at Technologic Partners in New York. "You'd be foolish."

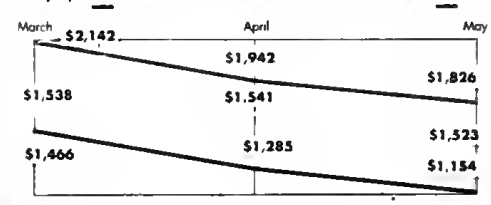
Now that the market leaders have slashed their prices to form a level playing field, corporate customers are being enticed back into the first-tier fold by the promise of long-term vendor viability as well as proven service and support.

"We really faced a dilemma," said Jim Hansel, vice president of investment systems at UBS Asset Management (NY), Inc. "We didn't have the gall to try to justify a price comparison that was 3:1, so we started switching [to

Continued on page 12

Plumbing new depths

Compaq's go-for-broke price-cutting efforts have caused a 14.8% drop in prices during the past three months



Source: Computer Intelligence

Shifting satisfaction

COMPUTERWORLD BUYER'S SCORECARD

Capacity upgrades and advances in other key areas helped FileNet's image processing product to score higher in user satisfaction than its competitors this year, while Wang's WIIS slipped significantly.

See Buyers' Scorecard, page 59

Product	Score 12/91	7/92
FileNet's WorkFlo	77	79
Wang's WIIS	84	76
IBM's ImagePlus	75	72

Maximum score: 100

TURBOCHARGED!

Borland gazes through Windows at IS

BY JAMES DALY
CW STAFF

Borland International, Inc. will attempt to execute a tricky double play this summer as it tries to take on aggressive competitors in the Microsoft Corp. Windows market while maintaining the loyalty of an increasingly demanding user base.

Nine years after Chief Executive Officer Philippe Kahn started the Scotts Valley, Calif.-based company in a Silicon Valley hideaway, Borland stands at perhaps the most important crossroads of its history. The company is seeking to reach beyond its beginnings as a supplier of microcomputer software into the big leagues of partnering with information systems managers.

But first, Borland must not only break a product development logjam but also take steps to

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Microsoft seeks to prove NT's viability

Operating system delivery schedule still unclear

BY CHRISTOPHER LINDQUIST
CW STAFF

SAN FRANCISCO — As Microsoft Corp. attempts to tear the "Not There" label off Windows New Technology at this week's Win32 Professional Developers Conference, it will also have to fight doubts that the advanced operating system will ship by year's end.

Microsoft seems to be hedging somewhat on the release schedule. Dwayne Walker director of Windows NT and networking products, said Microsoft will not be able to determine an absolute ship date until September, which coincides with the broad-based end-user beta test scheduled for that time.

Doubt reigns

Some observers were even more skeptical. "To expect that NT will be debugged and meet user requirements from a commercial environment perspective in 1992 or 1993 is unrealistic," said Judith Hurwitz, president of Hurwitz Consulting Group in Newton, Mass. She pointed to previous operating system releases that arrived late, including DOS 5.0 and OS/2 2.0, and said she expects third-party developers and Microsoft to encounter more problems than they seem to have anticipated.

Hurwitz also said some early NT developers she has talked to have expressed doubts that NT would ship on schedule.

But not everyone agreed. Other developers, including Frame Technology Corp. and Arbor Software Corp., think the December ship date is feasible.

"Yes, it seems realistic," said Siva Kumar, vice president of the Desktop Products Division at San Jose, Calif.-based Frame

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IBM caves in to Legent on SystemView pact

BY JOHANNA AMBROSIO
CW STAFF

VIENNA, Va. — After a year of negotiations, Legent Corp. last week joined IBM's SystemView initiative after IBM capitulated by offering a less-costly arrangement. Legent's involvement could entice other software vendors to sign up, resulting in more SystemView products, thus creating an impetus down the road for hesitant customers to implement IBM's systems management architecture.

SystemView, announced in September 1990, is IBM's broad vision of how to manage heterogeneous systems across the enterprise using different vendors' software products from one or several points of control.

Users reacted positively to the Legent/IBM arrangement, but many said they are in no hurry to implement SystemView.

"We prefer [Legent's] products to be SystemView-compliant. We're not doing anything with SystemView at the moment, but it's important that Legent is going in that direction," said Carryl Seaman, chief information officer at HomeFed Bank in San Diego and a Legent customer.

Raymond Wiles, vice president of data center services at TransAmerica Insurance Group in Woodland Hills, Calif., said, "SystemView is . . . something that will come in by osmosis, and

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RICHARD SHAFFER
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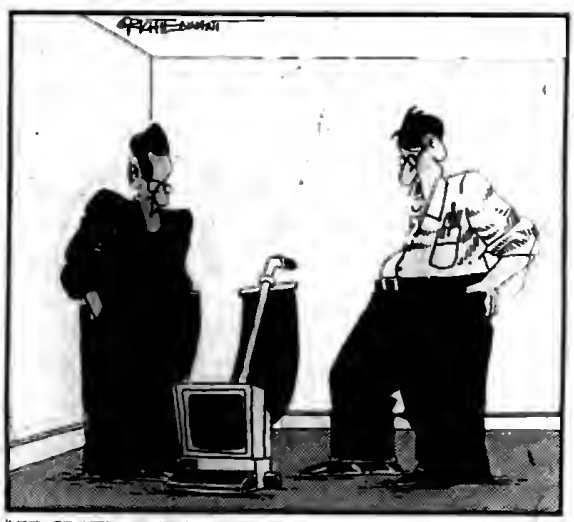

"IT STARTED OUT AS A KIT, AND WHILE I WAS WAITING FOR PARTS, THEY MERGED WITH A VACUUM CLEANER COMPANY."

EXECUTIVE BRIEFING

■ **Does Microsoft's Windows NT have what it takes?** More than 4,000 developers are in San Francisco this week to find out. Tool vendors are ready to ship products, but questions remain as to whether NT can meet its own December deadline. **Page 1.** IBM and Microsoft's settlement of royalty and patent disputes ensures against a long legal battle, but users differ on whether their buying decisions will be any easier. **Page 4.**

■ **Sidney Diamond exits the VP IS post at Black & Decker** — and the position itself is in question as the tool manufacturer continues to roll IS out into its business units. **Page 6.** Aetna plans to cut 700 IS workers as part of a companywide layoff. The cuts are expected to save $200 million by the end of 1993. It's unclear whether the layoff will affect an initiative to standardize office automation hardware and software across Aetna's 15 business units. **Page 6.**

■ **Corporate buyers are flocking back to name-brand clone makers** as a result of the PC price wars. Analysts expect a shakeout among third-tier players. **Page 1.**

■ **Slap a 10% tax on TVs** and use the money to fund R&D to build notebook computers you can read like a book. That's one author's proposal for aiding the U.S. high-tech industry and creating a computer-savvy labor pool. **Page 77.**

■ **For those tired of vanilla notebooks,** plenty of new flavors are on the way. They include Gateway's Handbook, a sub-3-pound, 6- by 10-in. DOS PC, and Dell's 320SLI, a 3.6-pound notebook sans a floppy drive. **Page 12.**

■ **X terminals are shipping in greater numbers than ever,** with nearly 120,000 units sold in 1991 — up from 12,000 units in 1989 — according to a study by the X Business Group. More are being sold to commercial sites, helping users perform tasks in areas such as CASE, CAD and groupware. **Page 67.**

■ **Novell's network management strategy suffers from incompatibility** between the OS/2 and Windows versions. Novell says it's working on improving links between the products. **Page 15.** The next version of NetWare won't be just an enhanced NetWare 3.X but rather something aimed at a different, higher level of use than the current top-end version. **Page 49.**

■ **Network technology can mask** the complexities of a migration to new systems. Homegrown solutions and standards such as X Window can give end users access to proprietary systems that are being phased out while open platforms are being brought in. **Page 51.**

■ **Computer Associates says it will lead users** of dBFast and Nantucket's Clipper environment toward the object-oriented Aspen product. **Page 63.**

■ **If you haven't planned a summer vacation,** you might want to reconsider. IS managers are encouraging employees to take a break, as it has a positive effect on their productivity. **Page 84.**

■ **The question whether to go proprietary or open** when choosing a DBMS brings that good old answer: "It depends." Users are split, saying the flexibility of open systems is nice, but performance is better on a proprietary DBMS. **Page 53.**

■ **On site this week:** Pacific Bell Directory discovers that choosing a computing platform may come down to such simple questions as whether the computer can fit in a sales rep's purse. **Page 39.** OS/2 2.0 migration takes planning, and Huntington Bancshares is going through its plan one step at a time. **Page 39.** Citibank Credit is extending its commitment to **Sun** workstations, launching plans to move commercial applications such as general ledger onto the Unix platforms. **Page 50.**

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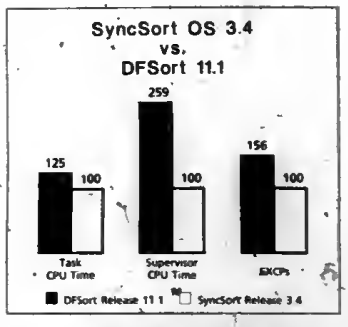

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Borland exterminating dBase IV 1.5 bugs

BY MARK HALPER
CW STAFF

SCOTTS VALLEY, Calif. — The ghost of Ashton-Tate Corp. was haunting the laboratories last week at Borland International, Inc., where technicians were trying to figure out whether dBase IV 1.5 is hexed with major bugs.

A spate of reports alleging dBase problems have run through electronic bulletin boards and other channels recently, prompting Borland's concern.

The more serious complaints maintain that index files are being corrupted to the extent that users cannot locate records, that dBase is losing text from memo fields and that memo field text is occupying entire disks, producing system hang-ups.

Similar problems led to the demise of Ashton-Tate, the previous purveyor of dBase. Borland acquired Ashton-Tate and the rights to dBase last fall. It released its dBase update, Version 1.5., earlier this year, a move that developers had hoped would exorcise dBase's ills once and for all.

Borland has already begun issuing new dBase disks to developers who, during the last month, have reported what are "minor problems," according to Borland dBase product manager Vince Mendillo.

What proof?

The most severe bug that Borland has had to correct, Mendillo said, has been the inability of some dBase programs to operate the run function in DOS 2.1. The run function allows dBase to execute external commands.

But Mendillo said Borland "has been unable to reproduce" the more serious problems reported by at least three developers.

One of those developers, Susan Perschke, president of Spectrum Data Design in Aurora, Colo., has developed a dBase 1.5 records management program for the state of Colorado. Perschke said corrupt index files have made it virtually impossible to locate records, and her memo field text, which should have occupied about 20K bytes of disk space, swelled to 65M bytes.

"I had no space left to manipulate the data. It took me 3½ weeks to clean it up," Perschke said, noting that in order to safely store the data, she had to remove other programs from her 486-based system and store segments of data on numerous floppy disks.

"When this happened, it was like someone loaded 1.0," Perschke observed, referring to an earlier Ashton-Tate version of dBase. "It was hauntingly familiar."

Borland asked Perschke to send it the application and code more than a week ago, but Mendillo said the company had not yet received it. Perschke said late last week that she had just received permission from the state to send the program and would do so shortly.

Mendillo said he is aware of three reports of "anomalies with memo fields" but that any data that is lost can be recovered using utility files.

Could have been worse

Another developer — not one of the three reports — is Mike Kretzer, a financial systems analyst at Lockheed Missiles & Space Co. in Palo Alto, Calif. He said he lost data from his dBase IV 1.5 memo field recently. Kretzer is getting ready to replace dBase 1.1 with dBase 1.5 on a 40-MHz, 386-based personal computer.

"I lost a couple of small records I had to rewrite," he said. "It wasn't a big deal," he added, "but if it was a larger production file, I would have been quite upset."

Mendillo said Borland has not received enough complaints to consider the memo field problem a consistent, recurring pattern. He claimed that the memo field problems may not relate to dBase per se but could be attributable to hardware configuration or other factors.

Possible roots

Michael Mitsch, a developer at Subaru-Isuzu Automotive, Inc. in Lafayette, Ind., pointed out that the cause could lie in clashing disk caching schemes, in which dBase's internal disk cache program fights with a computer's preexisting disk caching program.

Another developer, Pat Adams, president of DB Unlimited, a consultancy in New York, said the problems could stem from power dips, which are common during the summer.

There was a consensus that Borland must act to resolve what at this point is an enigma.

"If data is being lost, that's critical," said Fletcher Johnson, who is involved with a Bay area dBase user group and is president of Birchwood Systems, Inc., a development house in San Jose, Calif. "Anything else is just an annoyance," he added.

"If Borland gets right on this, they'll be fine," Perschke said. "If they take an ostrich approach, they'll be in trouble."

IBM, Microsoft call truce in battle of code rights

IBM OS/2 to still support Windows but not NT

BY CHRISTOPHER LINDQUIST
CW STAFF

NEW YORK — A declaration last week that IBM and Microsoft Corp. have resolved their long-raging software royalty dispute may have temporarily ended the bickering between the two industry giants. And the resulting calm may help users clarify the distinctions between the two companies' 32-bit operating systems.

Prior to the agreement, observers were left guessing as to exactly how far and for how long each firm's rights extended over the other's product. Particularly at issue was how long IBM would have access to Windows source code for use in OS/2, a major selling point of IBM's "integrating platform," OS/2 2.0.

Now, a date of September 1993 has been set for the end of source code rights, with IBM retaining the right to clone Windows application programming interfaces indefinitely.

For those to whom Windows support is vital, the issue had caused some consternation.

"I think it lifts the cloud that was over OS/2 and the potential of OS/2," said Sheldon Laube, national director of information technology at Price Waterhouse. He indicated that one concern over OS/2 had been its continued ability to support Windows applications. Under the new arrangement, such support is guaranteed for at least several years.

Of passing interest only

But while some users were relieved by the news, others said they felt it would have little impact on them.

Dave Arthurs, manager of systems planning at Kotter & Co., said, "I didn't really see how it was going to have any impact on us."

The deal should end the increasingly messy spitting match that began between the two firms when Microsoft announced its intention to veer away from the OS/2 path.

IBM and Microsoft "agreed to disagree on desktop operating systems," according to Microsoft Executive Vice President Steve Ballmer, but they realized they must work together in some areas.

Those areas include the ability of IBM hardware to run Microsoft software, including Windows New Technology (NT).

Perhaps more important is the ability of customers to have some confidence in making purchase decisions, a situation that could have become a nightmare if Microsoft and IBM had locked horns in a lengthy legal battle.

There are no losers

Microsoft also wins. The various royalty fees owed to it by IBM are now made clear, and a $10 million to $20 million payment lets it avoid wading through IBM's sea of patents in court. In addition, IBM will have OEM rights to Windows NT and can sell it on IBM hardware. And Microsoft will still be able to incorporate OS/2 code into NT until September 1993, although it is unclear if this will have a major impact on user interest.

While OS/2 is being touted by IBM as an "integrating" platform for using a variety of operating systems simultaneously, Windows NT is positioned more as a transitional operating system for users looking for a high-powered, secure environment.

The agreement also ends all speculation that any future versions of OS/2 will use all or part of the NT kernel. IBM gave up all rights to use the NT source code except for porting NT to its hardware. "We're not paying for future development of NT," said Lee Reiswig, assistant general manager of programming.

He indicated that the NT kernel was too tailored to Windows to be of use with OS/2. However, he noted, IBM's OEM agreement will still allow it to see NT's source code to determine functionality and performance.

Burying the hatchet

The IBM/Microsoft agreement appears to put an end to the fray that followed Microsoft's break with OS/2 — and so keeps the two out of court.

The following terms will be applied by the new pact:

- Microsoft will supply IBM with source code for all Windows versions that run on top of DOS, including 32-bit versions, until September 1993. Similarly, IBM will give Microsoft the source code for OS/2 until that time.
- Each company will be allowed to use the other's source code in its own products at set royalty rates. A Microsoft spokesman indicated that the royalty rate for each copy of OS/2 2.0 is somewhere between $15 and $30.
- IBM will receive source code to Windows NT under an OEM agreement for porting the operating system to IBM hardware.
- Microsoft and IBM will exchange technology patent libraries, allowing both to license for both current patents and any others that occur within the next five years. Microsoft agreed to pay between $10 million and $20 million for access to IBM's patents, according to Steve Ballmer, Microsoft's executive vice president of worldwide sales and support.

CHRISTOPHER LINDQUIST

NEC repairs faulty drives

BY MICHAEL FITZGERALD
CW STAFF

BOXBORO, Mass. — NEC Technologies, Inc. confirmed reports from several users that it is having problems with the 80M-byte hard drive version of its UltraLite notebook products based on Intel Corp.'s 80386SL processor and has stopped shipping them. The problem appears isolated to NEC and some of the 80M-byte hard drives it has shipped.

The company said the problem was in the firmware of the Quantum Corp. drive, which was customized to work with NEC's system management software. A NEC representative said the firm has solved the problem, is in assurance testing and will resume shipping the 80M-byte drives this month. Until then, those customers that do have problems will receive 120M-byte drives at no extra cost.

While it refused to say how many drives were failing, NEC claimed the rate was higher than the normal hard disk malfunction rate but did not elaborate.

Richard Nelson Jr., vice president of agency systems at New York Life Insurance Co., one of NEC's largest customers for portables, said he personally had received three machines with the problem, although the company in general did not have that high a failure rate.

LOOK WHO'S COOPERATING ON A COOPERATIVE-SERVER DATABASE

The world's largest database company introduces a revolutionary new technology called a cooperative-server database. A cooperative-server database hides the complexity of computer networks by enabling applications to access data located on multiple computers just as if all the data were stored on a single computer. In this way, a cooperative-server database simplifies application building and improves decision-making by making access to information easier...much easier.

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Chairman and CEO
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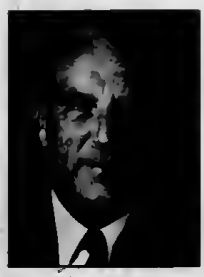

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NEWS SHORTS

French firm buys IBM's Cadam line

France-based Dassault Systemes, an IBM partner in the computer-aided design, manufacturing and engineering (CAD/CAM/CAE) market, last week formed a new firm that has acquired IBM's entire line of Cadam software products. The new firm, Dassault Systems of America Corp., will pursue a single, unified architecture to support both Cadam products and its own Catia line of CAD/CAM/CAE applications. More than 3,000 IBM mainframe shops use Cadam and Catia products.

EPA ditches remainder of CSC pact

The Environmental Protection Agency last week canceled the last two years of a five-year, $347 million contract with Computer Sciences Corp. (CSC) as part of the agency's overhaul of its procurement practices. The EPA is probing allegations that CSC overbilled for its computer support services but said the contract truncation stemmed from a desire to reduce reliance on a single company.

Oak Ridge Lab buys Intel Paragon

The Oak Ridge National Laboratory in Oak Ridge, Tenn., will buy Intel Corp.'s Paragon XP/S, a supercomputer that runs at 150 billion floating-point operations per second. The laboratory will also serve as a beta-test site for the next generation of hardware and software for Intel's supercomputer line. The two companies also signed a three-year Cooperative Research and Development Agreement under which they will support the U.S. Department of Energy's Technology Commercialization Initiative.

Apple software eases DOS access

Apple Computer, Inc. last week unveiled Macintosh PC Exchange, a $79 software package that allows Macintosh users running System 7.0 and equipped with an Apple SuperDrive floppy disk drive to read, write and format IBM Personal Computer-compatible disks. Files on the PC-compatible disk appear on the Macintosh's screen as standard Macintosh documents and can be imported into Macintosh-based applications. The DOS-formatted disk can be used to transfer Macintosh files to a DOS computer.

Bill limiting RBOC options wins one

The House Judiciary Committee last week passed a bill that would effectively bar the regional Bell operating companies (RBOC) from offering information and long-distance services and from manufacturing equipment. The bill would codify the terms of the AT&T Consent Decree and wipe out a court decision last year that said RBOCs could offer information services.

Short takes

Former **Mellon Bank NA** information systems chief George DiNardo surfaced last week as the new president of Naugatuck, Conn.-based **FBC, Inc.**, the wholly owned IS subsidiary of Orlando, Fla. based Kirchman Corp. . . . **Corporate Software, Inc.** has appointed former **Microsoft Corp.** Senior Vice President Scott D. Oki to its board of directors. . . . The **Multiuser DOS Federation** has rejected Microsoft's demand that it stop using MDOS as part of its name. The federation is attempting to register MDOS with the U.S. Patent and Trademark Office. . . . **Lotus Development Corp.** joined two major open systems groups last week: **Unix International, Inc.** and the **Open Software Foundation**. . . . A wireless option for **AT&T**'s EasyLink customers will be developed by AT&T and wireless network provider **RAM Mobile Data.** The product is slated for delivery next year. . . . **Storage Technology Corp.** and IBM have teamed up — despite their rivalry in the tape-library market — to go after a multibillion dollar **NASA** contract, the 15-year Earth Observing System. . . . **Digital Europe** and **Apple Computer Europe, Inc.** have signed a letter of intent to distribute some of each other's products, including Apple Macintoshes and **Digital Equipment Corp.** interconnection products as well as VAX- and reduced instruction set computing-based servers.

More news shorts on page 16

Aetna to slash IS staff by 700

Cutbacks at insurer are expected to save a total of $200 million by 1993

BY KIM S. NASH
CW STAFF

HARTFORD, Conn. — Aetna Life & Casualty Co. might do well to tack on "with less" to the end of its advertising ditty, "A policy to do more."

The fourth-largest insurer in the U.S. last week began pink-slipping the first of 4,800 employees targeted for layoffs between now and 1993 — 700 of whom will be cut from Aetna's 4,900-member information systems department.

Aetna's internal newsletter served as official notification of the layoffs for some employees, although scuttlebutt had permeated the ranks for months [CW, Feb. 3].

The layoffs — expected to save a total of $200 million by the end of 1993 — raised questions about the status of Consistent Office, a plan started in 1990 to get Aetna's arms around its set of disparate office automation tools and set standards for software and hardware.

Several executives in the Aetna Information Technology (AIT) Group refused to comment, including John Loewenberg, AIT's senior vice president who reports to company Chairman Ron Compton.

May be positive

Analysts were optimistic, though, that the layoffs were a good thing. "They know where to cut. Ron Compton did a similar show at Emery [Airborne Express] in the 1980s, turning that company around," said Robert Riegel, assistant vice president at Moody's Investors Service, Inc. in New York.

However, Riegel and other observers noted that certain risks are linked to such a large reduction. Low morale at a firm already hit with layoffs totaling 2,600 employees during the course of 1990 and 1991 might just sink altogether, agreed Greg Schmergel, a consultant specializing in financial services at The Ernst & Young Center for Information Technology and Strategy in Boston.

Technology is a major part of Aetna Health Plans, the firm's group health insurance unit, which has grown during the past few years via the acquisition of several regional health maintenance organizations (HMO). The new HMOs likely left Aetna with duplicate functions in IS, as well as in other departments, that it would be wise to zap, said Ellen Barzilai, an insurance analyst at Alex. Brown & Sons, Inc.

Aetna management seems to have realized this. For example, after absorbing Partners National Health Plans in Irving, Texas, in 1990, Aetna trimmed its work force and consolidated both existing and acquired IS functions [CW, Sept. 30, 1991].

Aetna recently took over Freedom Health Care, Inc., a large HMO based in Wayne, Pa., and Bay Pacific Health Corp. in San Bruno, Calif., but spokesmen would not indicate if IS cuts would happen as a result of these additions.

Too close for comfort

Insiders, who declined to be identified, reported being under management's microscope since January, as executives evaluated who was doing well and who was expendable as a way to "eliminate redundancies" in the department overall.

Although competitors such as The Travelers Corp. and Cigna Corp. have already made drastic staff reductions during the past few years in an effort to cut costs, Aetna is not necessarily late to the party, Riegel said.

He cited the companywide 2,600-person purge announced late in 1990 that coincided with an IS revamp.

In the fall of 1990, the company reorganized AIT to "try to get control of a chaotic department," according to a former IS staff member who asked to remain anonymous.

"The most recent round [of layoffs] is getting so much attention because it's so big," Riegel said.

At a glance

Aetna Life & Casualty

IS budget:
$600M (3% of revenue)

IS staff:
4,900*

Percent of IS budget spent on staff:
41%

Installed processor value:
$70M

*Prior to layoffs

Source: Computerworld Premier 100 (September 1991)

Diamond deals self out of Black & Decker deck

BY NELL MARGOLIS
CW STAFF

TOWSON, Md. — Sidney Diamond, who helped push Black & Decker Corp. to the forefront of information technology use as its top-ranked information systems executive, may have worked himself out of a job.

Diamond handed in his badge last week. Contacted at home, he described his move as the logical and inevitable outcome of the very strategies he has actively helped implement during the past several years: "Downsizing, outsourcing and decentralizing."

"I guess in a way I've worked myself out of my job," said Diamond, who was vice president of worldwide IS. "It was just a matter of when to say when."

No particular event precipitated his departure, he said. A several-year plan under way at the tool manufacturing firm to roll corporate IS employees out into the business units is reaching its final stages, he noted.

With "the last big chunk" recently transferred to the firm's core Power Tools Group, once-central corporate IS is now a significantly reduced stronghold — half of its former size. Once 175 strong in 1988, staffing now stands at 87, according to a source close to the company who requested anonymity.

But signs of an anticipated executive departure were in scant supply at Black & Decker last week. Don Lee, who reported to Diamond as director of technical services and operations, confirmed that he will be taking on the additional title of acting manager of worldwide operations "on an interim basis."

Precisely what duties come with the job, or whether it will gel into a permanent position as senior-most IS executive, remain uncertain, he said. A company spokesman declined all comment on the changing of the guard.

Diamond *'worked myself out of my job'*

But if IS reporting lines and structure are unresolved, Black & Decker's IS mission is clear: "We will still provide the right tools and resources to enable the businesses to move quickly," Lee said. "And we won't be overly concerned with whose resources we're using — corporate IS' or the business'."

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Great expectations for OSF DME '94 delivery

BY ELISABETH HORWITT
CW STAFF

Network managers seemed largely unfazed by the news last week that commercial implementations of the Open Software Foundation's (OSF) Distributed Management Environment (DME) will not start appearing until early 1994. The consensus seemed to be that the wait will be worth it — if DME lives up to its promise to provide the first viable framework for integrated, enterprisewide network and systems management.

Last week, the OSF announced that it expects to make the full suite of DME protocols available for commercial implementation by the end of next year.

Hewlett-Packard Co., IBM, Digital Equipment Corp. and Tivoli Systems, Inc. are among the vendors that have promised DME implementations after the protocols are ready. This is the first official announcement of a delivery schedule.

For decentralized companies such as DHL Worldwide Express, DME provides the opportunity for different user groups to "choose the best [network management solution for them and then provide interoperability," said John McShane, a project manager at DHL Systems, Inc.

Citibank "feels that a lot of DME's functionality will be very useful in the area of heterogeneous systems management," said Harriet Schabes, a vice president at Citicorp Technology Office in New York.

Asked what makes DME stand out from earlier efforts as a network management standard, several users cited its object-oriented architecture, which buffers network management applications from the proprietary nature of the devices and systems they are managing.

The system could send out a command to shut down a multivendor printer installation, and DME's Management Request Broker would have on record exactly what protocols and commands are needed to find and address those printers, even if four different brands were involved, an OSF spokesman said.

"If Cisco or Wellfleet provided a router object in the right form, we could port it" to a DME-compliant management system, and it is immediately manageable via DME-compliant applications, "without training, headaches or customization," said Don Golden, a member of the Network Management Forum's User Advisory Council and a program manager at Shell Oil Co. in Houston.

"The thing to really watch is how fast third parties bring out [network management] applications to run on DME," said Mary Johnston, a principal at Northeast Consulting Resources, Inc., a Boston-based consulting firm.

Users have complained that today's proprietary systems only support a limited number of network management applications, she added. DME potentially solves that problem by letting third parties port their products to any DME-compliant system.

Points of resolution

DME also has the potential of resolving, once and for all, the ongoing "religious wars" about what will be the dominant network mangement standard because it supports both Common Management Information Protocol and Simple Network Management Protocol as well as a remote procedure call-based messaging system, according to Golden.

Users did express some anxiety over whether the OSF would adhere to its current schedule for releasing DME — recalling that earlier OSF standards efforts were delayed.

"The current schedule is practical, but we wouldn't mind seeing it hurry up a bit," Schabes said. "We are concerned that there might be delays. We won't stand still in the meantime. There's a lot you can do to ensure migratability" of pre-DME systems.

What makes DME tick?

Distributed Management Environment is a hodgepodge of technologies and standards that are delivered by six major vendors.

Management User Interface
Sources: Tivoli, HP.
Functions: Motif-based graphical user interface, the ability to call services and information as objects.
Advantages: No need to retrain network managers to work with each new network management system or application.

Application and Management Services
Sources: MIT, HP, Banyan Systems, Inc., IBM, Tivoli.
Functions: Common set of support functions such as printing, licensing, software and event management, event notification, policy implementation and classification of managed elements.
Advantages: Application vendors do not have to reinvent the wheel but can concentrate instead on value-added features.

Application Development Tools
Sources: Tivoli, Groupe Bull.
Functions: Common set of interfaces for network management applications.
Advantages: Network management applications can be ported to any DME-compliant network management system.

Management Protocols
Sources: HP, Tivoli.
Functions: Management applications and systems can exchange information and commands with one another and with managed elements.
Advantages: In addition to object-oriented remote procedure calls, DME systems can interact with non-DME systems that support either Simple Network Management Protocol or Common Management Information Protocol.

ELISABETH HORWITT

IBM caves in to Legent on SystemView

CONTINUED FROM PAGE 1

it will take a long time to evolve."

Until last week, IBM's SystemView partners — called the International Alliance — included Bachman Information Systems, Inc. in Burlington, Mass.; Candle Corp. in Los Angeles; Goal Systems International, Inc. in Columbus, Ohio; Platinum Technology, Inc. in Lombard, Ill.; and Information Retrieval Cos. in Chicago.

To become a full alliance member, a software vendor has to pay an up-front fee and a royalty on every copy of the SystemView product sold either by IBM or the vendor's own sales force (see chart).

A partner is born

The agreement with Legent, however, creates a new classification: development partner. The terms call for Legent to participate in the design and specifications of SystemView, but IBM will not market or sell Legent software. Bill Warner, director of enterprise management for IBM networking systems, said this new category is available to other vendors as well.

Although none of the parties involved would discuss finances, the development partner category was said by one observer to be at least half the cost of the full alliance category — a difference that could mean up to $1 million.

John Burton, Legent's president and chief executive officer, had declined to join the alliance under the original terms, saying that even though Legent supported the concept of SystemView, the cost to become an alliance partner was too high.

In past interviews, Burton had characterized the marketing piece as especially inappropriate for a company of Legent's size. "We are not in need of marketing support," he said.

Eases worries

The relationship, Burton added, "alleviates users' concerns about our ability to implement SystemView in a timely fashion. We never wanted a vision that said IBM was in one camp and Legent was in another, even though we've supported SystemView all along."

About five Legent products already comply with the first level of SystemView integration — a user interface — with some 20 more slated for compliance, Burton added.

Another impetus for Legent to join the SystemView team was its pending acquisition of Goal, already an alliance member. Still, exactly what Legent's SystemView agreement means to Goal is unclear, said Steve Sasser, president of Goal's Systems Software Division.

"We'll have to sit down with Legent and IBM and talk about what makes sense for everyone. I expect this to happen over the next month or two," he said.

No big thrill

Some industry watchers, including Jeff Schulman, an analyst at Gartner Group, Inc. in Stamford, Conn., said the Legent/IBM relationship will not have much of an impact.

"I don't think that others will jump on the bus because, the track record is so bad," he said. "It will help Legent's marketing because they will now have the Good Housekeeping seal, so to speak."

Olivier Thierry, director of marketing and business development at Boole & Babbage, Inc. in Sunnyvale, Calif., said, "You'll see SystemView gain momentum as more companies join; things are going to open up."

Boole & Babbage is negotiating to join the alliance, Thierry added.

Max Watson Jr., chairman of BMC Software, Inc. in Sugar Land, Texas, said he would consider getting aboard the SystemView bus if "we were to get similar terms to Legent." He said BMC has also declined to sign up thus far because of financial reasons.

"It was a simple business decision; we looked at benefit and cost. For us the alliance made zero sense because it was not worth it," Watson said.

Parallel course

IBM's SystemView allies are now grouped in two categories

- **SystemView Development Partner:** Gives companies an early peek at future releases of IBM products. Entitles them to sit on a design council to help draft technical specifications for SystemView. Other benefits include joint press conferences and press releases.
- **International Alliance Member:** All of the above plus an agreement for IBM to help sell the product. Price tag is an up-front fee plus between 10% and 15% of the product's total license revenue.

CW Chart: Tom Monahan

CORRECTIONS

Because of a typographical error, the June 22 issue of *Computerworld* reported that Wang Laboratories, Inc. is charging between $1,000 and $1 million for operating system software licenses on used VS computers. The correct price range is $1,000 to $100,000. Also, the federal district judge who ruled favorably on the pricing policy did so in California and not Massachusetts.

Northrup King Co. was misspelled in the June 15 issue.

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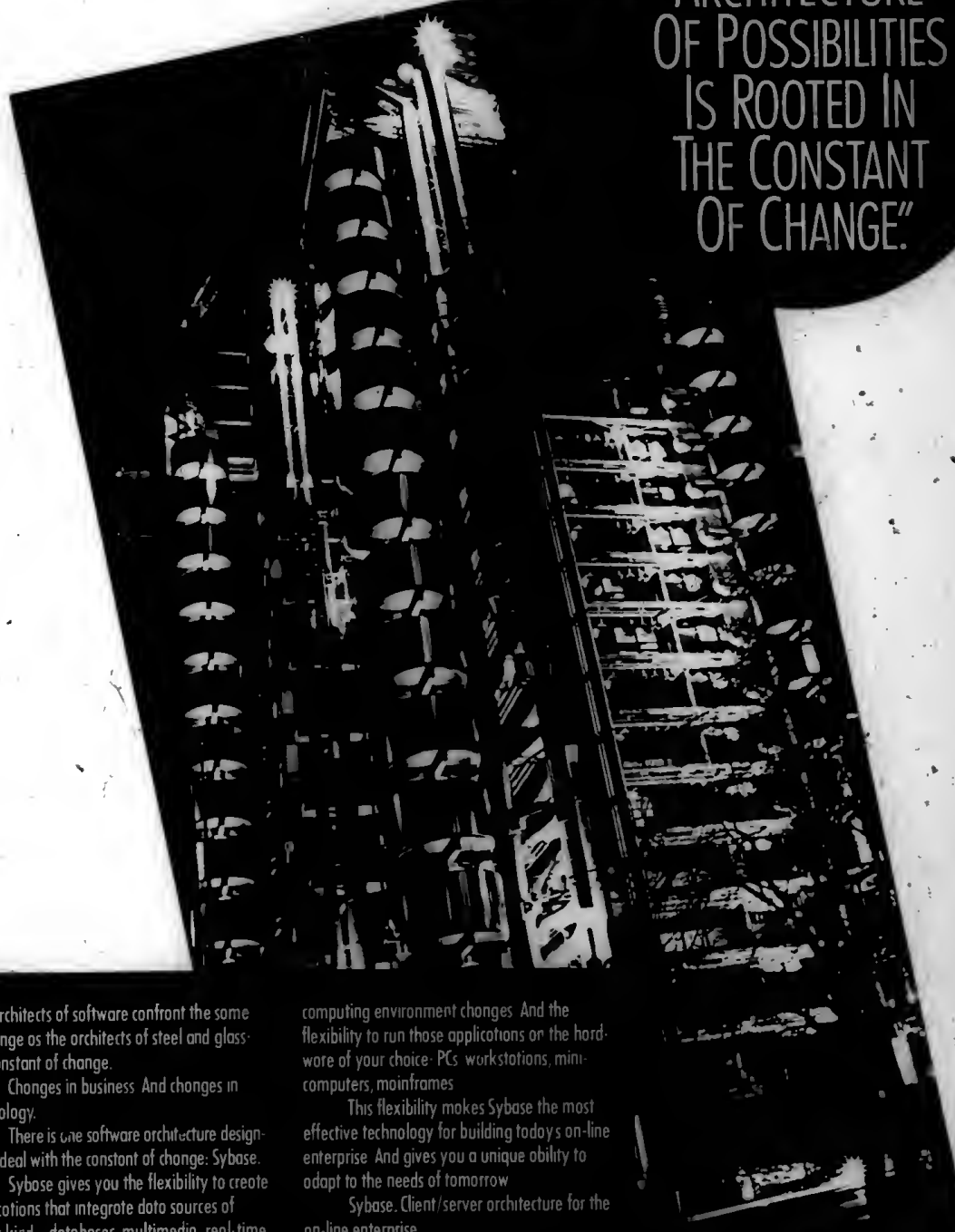

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CLIENT/SERVER ARCHITECTURE FOR THE ON-LINE ENTERPRISE

MCI throws hat into frame-relay ring

BY JOANIE M. WEXLER
CW STAFF

WASHINGTON, D.C. — Though bringing up the rear of the frame-relay rollout parade, MCI Communications Corp. last week announced the availability of service on what analysts called the most promising platform to date for migrating users to Asynchronous Transfer Mode (ATM) switching speeds.

Frame relay is a faster packet-switching scheme aimed at efficiently accommodating local-area network interconnection and other applications that generate unpredictable chunks of network traffic.

While MCI has suffered some industry tongue-lashings during the past year for being the last interexchange carrier to introduce a service, "it has missed out more on the frame-relay hoopla" than on business opportunities, said Chris Finn, an associate at TeleChoice, Inc., a telecommunications consultancy in Montclair, N.J.

Users have taken longer than expected to educate themselves about the fledgling technology, he noted. Meanwhile, MCI has built a T3 (45M bit/sec.) backbone network based on a core of Siemens Information Systems, Inc. ATM switches. A version of Wellfleet Communications, Inc. routers that function as feeder switches at the boundary of the network convert incoming frame-relay traffic into industry standard-size cells for transmission across the network via the Siemens backbones [CW, June 29].

A better choice

The equal-size ATM cells have been deemed more appropriate for multimedia applications, which contain delay-sensitive traffic such as voice and video. Eventually, a third inner tier of MCI's network will emerge to collect data from the T3 backbone and transport it at gigabit-range speeds. The MCI platform is similar in concept to that of StrataCom, Inc.'s IPX switches — the platform for several other frame-relay services. However, the IPX cells are nonstandard sizes and top out at T1 speeds.

The higher speed base is important because "right now, customers see ATM as the Holy Grail" of networking, Finn said. "Larger customers who aren't particularly mobile have to look five to seven years down the road" at what technologies they will be using.

The MCI infrastructure is integrated with MCI's automated order entry, service provisioning and billing systems — a benefit to MCI customers cited in a research note drafted early last month by Gartner Group, Inc., a Stamford, Conn.-based consultancy.

MCI is initially offering both fixed-rate and capped usage-sensitive pricing schemes on a contract basis for its frame-relay service.

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Kimberly-Clark IS exec to consult

BY NELL MARGOLIS
CW STAFF

CHICAGO — Two weeks after handing in his chief information officer badge at Dallas-based Kimberly-Clark Corp., John T. Kohler last week turned up as senior practice leader in commercial manufacturing at Technology Solutions Corp. (TSC), a systems integration firm.

"This isn't a new departure for me; it's more like coming back home," Kohler said. A decade ago, Kohler worked at Arthur Young, where he was hired onto the information systems front lines by client Kimberly-Clark. His move to TSC reunites Kohler not only with the consulting business but also with former Arthur Young colleague Albert D. Beedie Jr., who is TSC's chairman and co-chief executive officer.

"Being on the expense side of the [corporate IS] equation was beginning to wear," Kohler said. "It was time to return to the revenue side." He declined to expand on his reasons for leaving Kimberly-Clark [CW, June 29].

The first of Kohler's challenges, Beedie implied in a prepared statement last week, will be shaping the manufacturing practice. He will need to counterbalance blows to TSC's bottom line sustained in its recently closed 1992 fiscal year as a result of shortfalls in its aerospace and defense practices. Notwithstanding that hit, the firm posted a profit of $12.1 million on revenue of $71 million.

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Page 91

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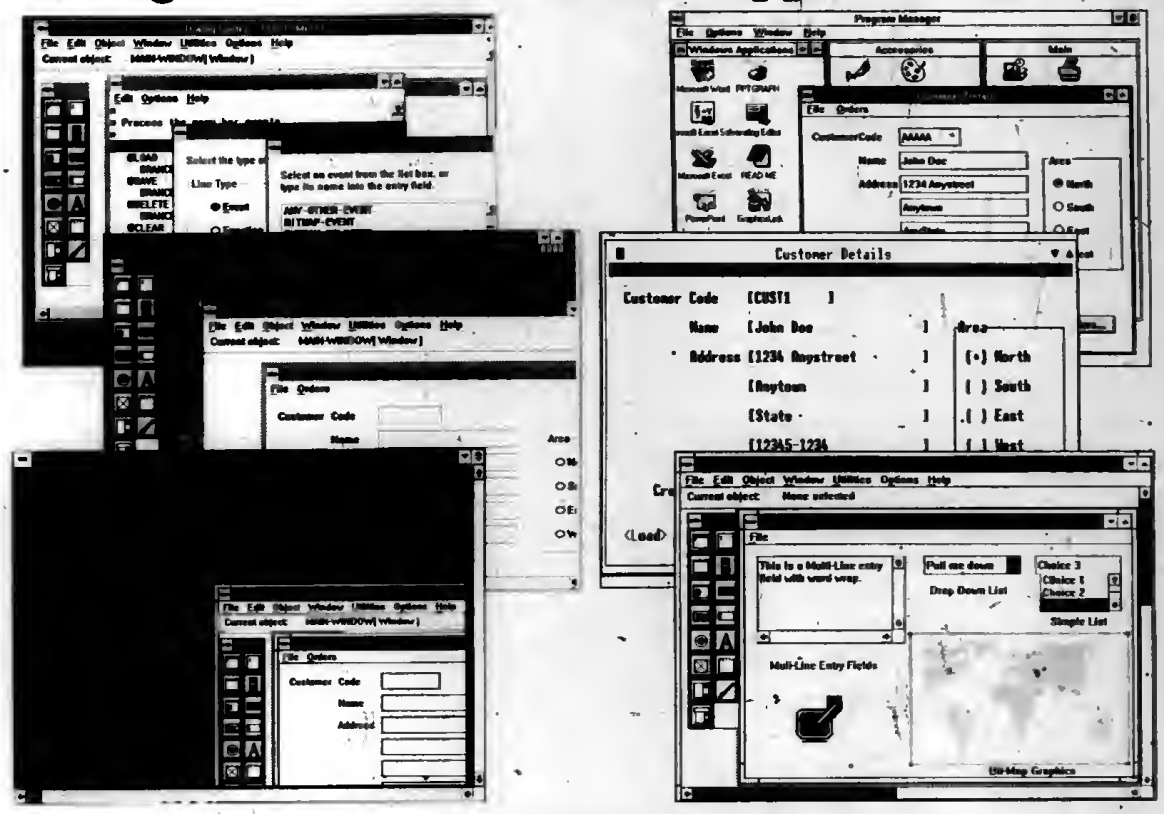

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Plethora of portables on way

BY MICHAEL FITZGERALD
CW STAFF

Vendor research laboratories will heat up this summer with the final preparations for an onslaught of portable technology targeted for fall delivery. Expect dramatic advances in weight and performance, with new features and entire new classes of devices hitting the market.

Some industry executives said they think the slew of new products and product types may create reasons for people to use several computers at a time, while some analysts speculated that some of the products will not survive. Driving the upcoming effort to differentiate portable products is the need for higher margins.

"It's been bloody out there, and vendors are realizing that a vanilla, 'me-too' box doesn't let them make any money," said Dan Ness Jr., an analyst at Computer Intelligence, a market research firm in La Jolla, Calif.

Vendors are moving to add features to their products, changing a market that was filled with Intel Corp. 80386SX-based notebooks that were essentially identical in features.

Now, analysts point to devices such as the removable hard drives employed by vendors such as Epson America, Inc., the modular architectures touted by Advanced Logic Research, Inc., among others, and the variety of new product designs from companies ranging from Compaq Computer Corp. to Beaver Computer Corp.

In addition, notebooks have embraced non-Intel chips, too. Many companies, such as Wyse Technologies, Inc., use chips from Cyrix Corp. and Advanced Micro Devices, Inc. in addition to Intel chips.

Standard features will continue to get larger, while new technologies such as flash random-access memory cards have already prompted some notebook vendors to banish floppy drives. And notebook makers will remain on crash diets to drive weight down as low as possible.

The shift away from me-too notebooks drew praise from users contacted last week.

"I think the notebook change is positive," said Chad Pearce, network administrator at Miller Mason & Dickenson's Philadelphia office. Pearce said less-expensive color screens in particular would be welcomed by his company, as would notebooks that could provide power-consuming 486DX technology without a loss in battery life.

Still, a more radical shift in portables than just color may be coming, if recently announced products from Dell Computer Corp. and Gateway 2000 Ltd. serve as a preview. Dell recently brought out a 3½-pound, slim 80386SL-based notebook computer, while Gateway released its Handbook, a 2¾-pound, 6 in.-by 10-in. personal computer.

While analysts expect the notebook market to continue to grow, in part because of products like Dell's, the Gateway product and those like it have a less certain future.

"[Dell's product] is great: It shoots the Phoenix ROM-based 8086 CGA subnotebook in the head," said Andrew M. Seybold, editor of the Brookdale, Calif.-based newsletter "The Outlook on Professional Computing."

Still, Seybold said, the lack of a floppy drive on the Dell machine could hurt it in the market, where the companion PC concept pushed by Phoenix Technologies Ltd. may succeed.

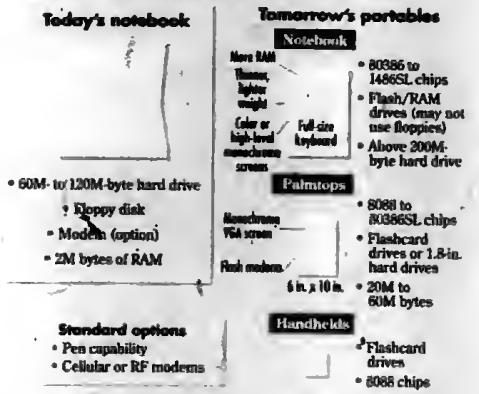
Information systems managers contacted said they liked this new class of PCs for personal use but did not see it making the corporate IS budget.

"In our organization, our laptop users are using Windows and OS/2, so these subnotebooks are kind of a technological step backwards," said Joseph King, assistant vice president of IS at Continental Insurance Co.

Many vendors who plan to enter the market for subnotebooks, or palmtops, said they will position them as consumer electronics devices and not PCs.

A vital transformation

Notebook computers are metamorphosing in a variety of ways:



CW Chart: Janell Genovese

Campaign '92: High-tech politics

BY CAROL HILDEBRAND and THOMAS HOFFMAN
CW STAFF

For George Washington, the closest thing to technical innovation was a set of poorly fitting wooden dentures that nonetheless made his speech more clear. Today's politicians increasingly rely on a battery of computerized gadgets to keep their campaigns humming.

So far this election season, technology applications have ranged from touch-screen voting to massive database applications to various forms of electronic debating.

At next week's Democratic National Convention, for example, delegates will vote via a touch-screen-based electronic voting system. The convention used a more primitive version back in 1988, but Roger Schneider, director of technology for the convention, said the system has been updated to the point where he has almost eliminated the need for training.

When the delegates gather in Madison Square Garden, they will find 60 touch-screen-equipped point-of-sale terminals from NCR Corp. The terminals are tied to a Unix-based NCR 3B series that runs all of the back-office functions.

The chairmen of the delegations can each send the number of yes and no votes for planks for their parties by touching the screen about three times. However, the systems will not be used to cast the actual votes for the presidential and vice presidential candidates — this will be done using good old lung power.

Schneider said a user could operate the system without any training, although the convention is providing classes. "Our paradigm was to imitate an ATM," he said.

Schneider said the party made a real effort to greatly amplify the use of cutting-edge technology. The convention is running Microsoft Corp.'s Windows 3.1 on top of LAN Manager on top of Unix and is also using Lotus Development Corp.'s Notes groupware.

On the GOP side

The Republican National Convention, which will be held Aug. 17-20 at the Houston Astrodome, will not use electronic voting systems, according to Joseph Fleming, the press secretary for the convention. But it is not abandoning computer support altogether. Fleming said the convention is using 27 different databases supplied by DataPerfect, WordPerfect Corp.'s database offering, to access information on the convention's housing options in Houston, on transportation alternatives and on each of the volunteers working at the convention.

The Republican National Convention is deploying 180 Hewlett-Packard Co. and Compaq Computer Corp. workstations to access database information running over three Novell, Inc. networks. WordPerfect's Office Electronic Mail systems run over the Novell networks. Information is printed out on HP LaserJet III printers.

"It's another way of communicating office-to-office in a high-speed and accurate manner," Fleming said of the convention's computer operations. Despite the information systems infrastructure, he said, the convention does not have any plans to conduct electronic town meetings like the Perot campaign.

Pricing could spur shakeout

CONTINUED FROM PAGE 1

clones]. Fortunately, now we can return [to name brands] because vendors have come back down in price."

With pricing rebuttals to Compaq's new low-end families already logged in from Dell Computer Corp., The Acer Group, Hyundai Electronics America's Information Systems Division, NEC Technologies, Inc., Digital Equipment Corp. and more in the works, industry analysts said, a shakeout among third-tier vendors is inevitable during the next 18 months.

In particular, several analysts have pointed out that some larger companies do not have the cash on hand to sustain a lengthy price war. "Such vendors as AST, Dell, Gateway and ALR are probably OK," said Michael Murphy, editor of the "California Technology Stock Letter." But, he added, "beyond that, it gets tough."

Users probably will not notice the winnowing because most of it will be the small, garage-type organizations, predicted Bill Bluestein, an analyst at Forrester Research, Inc. in Cambridge, Mass.

For Wally Nehls, a personal computer coordinator at a Midwestern banking software developer, the wars mean he can stick with Compaq: Pricing considerations had been driving him to consider the lower priced clones. "The biggest thing is to stay with a vendor I trust," Nehls said, adding that both the financial stability of a vendor and its reputation for quality are very important to him.

Mathew Cain, an analyst at Meta Group, Inc. in Westport, Conn., said many of his Fortune 1,000 clients are renewing interest in Compaq as a result of the price cuts. "People who were bouncing Compaq out of their RFPs are now relooking," he said.

For customers, the current climate means that taking a look at smaller companies' long-term viability before making a purchase is a necessity.

"Compaq has decided to press these guys to the mat. If you're buying low-end clones, you better rethink that but fast," Bluestein said.

Jn M. Haraf, director of office technology at Booz, Allen & Hamilton in Bethesda, Md., agreed: "That's why we're not doing business with some of the truly no-name products. We didn't feel that they were going to be around in six months to fulfill their one-year warranty."

However, a protracted price war, while good for customers' pocketbooks, could have a wearing effect in the long term as vendors continue to suffer losses while trying to price-cut their way to bigger market share.

Tom Willmott, an analyst at Aberdeen Group in Boston, said he did not think manufacturing costs, overhead and margins were coming down as fast as vendors' product prices. In a slow-growth hardware market, he doubted whether the reductions would increase unit volume enough. "For the supplier side, it's relatively suicidal," he said.

Nehls agreed: "I don't think a price war will necessarily be good for the industry — it's like the airline price wars," where airlines have been hemorrhaging cash and, in some cases, dropping out of the market.

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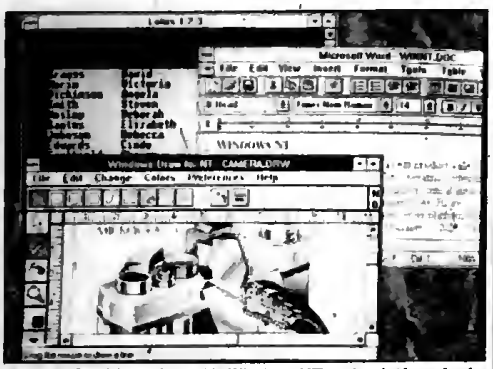
Microsoft seeks to promote NT

CONTINUED FROM PAGE 1

TeChnology. He added that the incremental releases of NT that his firm had been receiving were improving in quality, though some features, such as a TrueType font manager, were still missing.

More than 4,000 independent software vendors, analysts, users and journalists will reportedly attend the conference, where Microsoft will try to convince them that the 32-bit Windows NT is indeed the platform for future development.

Toward that end, Microsoft's battery of ammunition will include NT demonstrations and technical discussions, a keynote by Chairman Bill Gates and demonstrations and announcements of third-party development products by more than 40 vendors. Some 25 NT development tools will also be available at the conference, according to Microsoft (see story this page).



Microsoft *will tout its 32-bit Windows NT as the platform for future development*

Taking it slow

Delaying the product, if necessary, may be a wise move. Microsoft has had a chance to learn from both its Windows 3.0 product and IBM's OS/2 2.0 that rushing to meet a deadline can haunt a company as users clamor for the bug fixes, device drivers and applications necessary to make an operating system usable.

Such thinking is evident in the company's bid to get early versions of the NT developers' kits into as many hands as possible. Every attendee at the conference will be given a compact disc/read-only memory (CD-ROM)-based kit that contains prerelease versions for both Intel Corp. and Mips Computer Systems, Inc. platforms of Windows NT, Win32 Software Development Kit (SDK) tools and a 32-bit version of the Microsoft C/C++ compiler as well as all on-line documentation. After the conference, developers will be able to purchase the SDK for a list price of $399 with paper documentation or $69 as CD-ROM only. The low pricing should help get the kit into the hands of some 20,000 to 30,000 developers that Microsoft hopes to have using NT by this fall.

Such a strategy will no doubt work in Microsoft's favor as it will help make available a large number of 32-bit applications the moment NT ships, which could help sway customers.

"We're anxious for our vendors to explore NT," said Dave Arthurs, manager of systems planning at Kotter & Co. in Chicago. Arthurs said his company is concerned with IBM's ability to sustain OS/2 2.0 and added that Unix was very appealing.

However, he said, if NT meets its hype, it could give him the best of both worlds: the functionality of Unix and the familiar interface and wide variety of applications for Windows.

"What makes me feel comfortable with NT is hearing that developers are going to get copies," he said. "That's the only way that [Microsoft's] really going to be able to fine-tune the operating system."

Newer Technology

While the prerelease version of Windows NT will be aimed primarily at developers of 32-bit Windows applications, the final version — scheduled for release at year's end — should contain much more, including the following:

Available at release:

- Complete DOS, 16-bit Windows, Windows NT, Posix and OS/2 character mode subsystems.
- Transmission Control Protocol/Internet Protocol and a Distributed Computing Environment Remote Procedure Call-compliant support.
- Built-in Microsoft Mail support.
- Ability to use NT as both a client and a server in networked environments as well as redirectors for use with LAN Manager, Novell, Inc.'s NetWare and IBM's LAN Server systems.
- Full multiprocessor support.

Available simultaneously with or shortly after release:

- NT-specific SQL Server with 32-bit and multiprocessor support.
- Systems Network Architecture services and a variety of system and network management products.

CHRISTOPHER LINDQUIST

Borland compiler elicits cease-fire with Microsoft

Industry archrivals to cooperate at conference

BY MARK HALPER
CW STAFF

SCOTTS VALLEY, Calif. — In recent weeks, Borland International, Inc. Chairman Philippe Kahn has let loose with a series of unflattering remarks about Microsoft Corp., likening Microsoft's Fox logo to a dog and claiming he has tried Windows but has not inhaled.

But at least for a moment at this week's Win32 Professional Developers Conference (see story page 1), the two companies will swap olive branches.

Not that either company has been overwhelmed with benevolence toward an archrival. Rather, both are approaching an hour of need.

The occasion will be a 60-minute presentation by Borland of its C++ object-oriented compiler — a product that will go head-to-head with Microsoft's own C++ — for Microsoft's Windows New Technology (NT) and for the Win32s application programming interface.

The demonstration will mark Borland's first public showing of its NT C++. It will apparently also mark the first time that Borland has chosen to demonstrate a product at a Microsoft event.

"We're taking it up several levels," said Gene Wang, vice president and general manager of Borland's Languages Business Unit. "We've never been part of one of their conferences."

Hoping for exposure

The timing is understandable, considering that Microsoft, Digital Equipment Corp. and Symantec Corp. all plan to start offering their own C++ compilers next week. Borland will not ship its product until after NT becomes available and hopes its demonstration next week buys it mind share among other developers.

For Microsoft, having the leading C++ on hand at the NT developer's conference should help build NT momentum.

There is one addendum to the scenario. Borland has not completely let down its barbarian guard: Kahn himself will not be there.

Developer show touts Windows tools

Attendees to see dozens of demos — with many more products promised

BY CHRISTOPHER LINDQUIST
CW STAFF

SAN FRANCISCO — Tools, tools, tools.

In addition to supplying all of its own development products, Microsoft Corp. claimed that some 100 independent software vendors have promised to release more than 141 tools for 32-bit Windows, including Windows New Technology (NT). To help get the word out, Microsoft will ship a compact disc/read-only memory package containing a variety of text, advertisements and working models of 32-bit third-party tools to all Win32 Professional Developers Conference attendees two or three weeks after the conference.

Thirty-six companies reportedly will be demonstrating products at the conference, and about 25 of them should be ready to take orders, at least for beta-test versions of their products. Still other vendors will be announcing tools at later dates. Among the committed vendors are the following:

- **Texas Instruments, Inc.** has pledged to make its Information Engineering Facility computer-aided software engineering tools available on NT.
- **Sybase, Inc.** will be on hand to show off a 32-bit, multiprocessor version of SQL Server for NT running on a four-processor machine.
- Not to be outdone, **Oracle Corp.** will have its Oracle Server up and running on an NT-based system. Oracle was seen running on a multiprocessor NT server as early as this year's Comdex/Spring.
- **Watcom International Corp.**'s Watcom C/386 32-bit C compiler.
- **Symantec Corp.**'s Zortech C++, one of several 32-bit C++ compilers scheduled for the near future.
- **Knowledge Garden, Inc.**'s KPWin for NT.
- **Digital Equipment Corp.**'s DEC C++ for Windows NT.
- **Blue Sky Software Corp.**'s WindowsMaker, BugMan and RoboHelp Windows design and debugging utilities.
- **Congruent Corp.** will demonstrate the GNU programming tools popular on Unix platforms, for NT.
- **Acucobol-85** plans to supply an NT version of its product that already runs on Unix and mainframe environments.
- **Easel Corp.** will unveil its Easel/Win for NT application generation tool.
- **Frame Technology Corp.** will be on hand to demonstrate FrameMaker for NT, the 32-bit Windows version of its popular Unix publishing package.
- **Computer Innovations, Inc.** will have a pair of tools on hand: DEBUG 2000 and EDIT 2000.
- **Caseworks, Inc.**'s WorkBench will be on the show floor for demonstrations.
- **Guild Products, Inc.** will unveil the Guild Prototyper for 32-bit Windows.
- **Mozart Systems Corp.** will have an NT version of its product available for demos.
- **XDB Systems** will show XDB-Server for Windows NT.

> MICROSOFT WILL SHIP a CD-ROM package containing a variety of text, advertisements and working models of 32-bit third-party tools to all attendees two or three weeks after the conference.

Novell NMS rollout puzzles industry

Incompatibilities between Windows and OS/2 versions discovered

BY ELISABETH HORWITT
CW STAFF

PROVO, Utah — One point that Novell, Inc. did not make clear at the debut last February of its NetWare Management System (NMS) is that it was announcing not one, but two products, which can barely speak to each other.

Despite the OS/2 version's strong backing from the Novell/IBM alliance, the Microsoft Corp. Windows version appears to be the winner in terms of functionality and user and developer support. "I guess the market is pulling" toward Windows at the moment, Novell spokesman Duane Murray said. Novell recently sent out 600 copies of NMS in a controlled release.

Novell said it will soon provide more interoperability between the Windows version and the IBM OS/2 Presentation Manager version of NMS. However, the current versions might as well be from two different vendors: The products cannot exchange alerts or other management information, they target different types of network installations, and their user interfaces differ.

"It makes a big difference to a network administrator having to look at two different environments," said Craig Burton, chief executive officer of The Burton Group, a Salt Lake City consulting company.

Different goals

Furthermore, the two versions target very different markets. The OS/2 version targets shops where IBM host networks and Novell local-area networks predominate, while the Windows version represents Novell's bid for the enterprise internetworked LAN market. The Windows version supports Simple Network Management Protocol as a way to manage a wide range of network products; the OS/2 version does not.

Murray indicated that Novell and IBM are working to integrate OS/2-based NMS with Distributed Systems Management, the OS/2 implementation of IBM's SystemView that IBM has promised to release later this year.

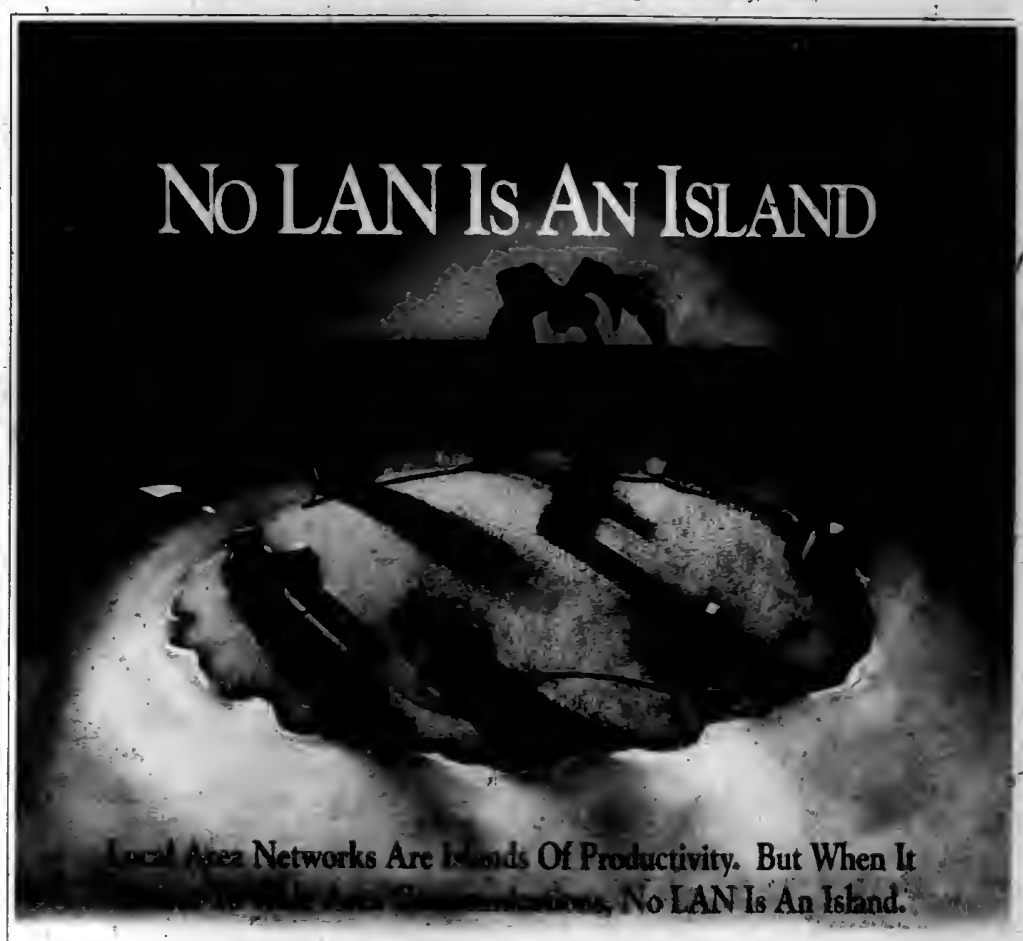
Right now, however, the only advantage that OS/2-based NMS offers over the Windows version is its ability to let users "walk through the NetWare Management Information Base one line at a time" — a capability that few users really need, Murray said.

Novell also confirmed that the two NMSs have incompatible application programming interfaces. This means that third-party vendors committed to supporting NMS on their products will either have to go with just one version or make the integration effort twice.

Of the several dozen vendors that have made that commitment, the "vast majority" have opted to support the Windows version, Murray said.

NMS will remain "pretty basic" until third-party products start bolstering its functionality, Burton said. Novell confirmed that third-party support is crucial to its NMS strategy.

Attesting to the marketing confusion surrounding the two unintegrated versions, Jim Queen, LAN manager at Enron Gas Services Corp. in Houston, said he is using the Windows-based NMS "because I didn't know there was an OS/2 version."



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NEWS SHORTS

HP debuts high-speed net chip

Hewlett-Packard Co. has unveiled what is said to be the first silicon chip set to support high-speed, point-to-point communications at rates of up to 1.5G bit/sec. The HDMP-100 Gigabit-Link Chipset is ideal for network boards that support broadband standards such as High Performance Parallel Interface (Hippi) and Asynchronous Transfer Mode, as well as multimedia, HP said. The chip set's compact design enables it to be incorporated into boards that will cost up to 80% less than current offerings, according to HP. Broadband Communications Products, Inc. said it is planning to release a serial Hippi board, priced under $20,000 and based on the chip set, in the fourth quarter.

IBM, AS/400 VAR spar in court

IBM Credit Corp. testified last week that Legal Eagles Software Systems, Inc., a San Diego-based developer, owes IBM several hundred thousand dollars for Application System/400-related deals made in the late 1980s. Legal Eagles counterclaimed, saying it had overpaid its bills, and pointed to a deposition by a former IBM employee who confirmed the claim. A decision could come as early as Wednesday, said Paul Breen, Legal Eagles' attorney. IBM Credit's lawyer was unavailable for comment.

AST shuffles deck, COO resigns

AST Research, Inc. Co-chairman and Chief Operating Officer Thomas C. K. Yuen resigned last week at the behest of AST's board as part of wide-ranging management overhaul. The directors, acting on the recommendation of a management consulting firm, decided both to replace AST's two-person chairmanship with an outsider and to phase out the COO post, a spokeswoman said. Former AST Co-chairman Safi Qureshey remains with the company as chief executive officer and president. Carmelo Santoro will assume the position of chairman of the board, while Yuen will remain on the board.

Unysis beefs up Unix server line

Unisys Corp. expanded its line of Unix-based, U 6000 mid-range servers with the debut of the U 6000 Model 65 servers. They incorporate Intel Corp.'s 1486 CPU with a complex instruction set computing-based architecture that was designed for symmetrical multiprocessing. The new models deliver between 42 million and 200 million instructions per second. A single processor system with 16M bytes of main memory costs $24,000; a dual-processor system with 64M bytes of main memory and 425M bytes of disk storage costs $47,500.

IBM ends CFC use at San Jose site

IBM turned off the last chlorofluorocarbon (CFC) cleaner at its San Jose, Calif., disk drive manufacturing facility last week — a site once regarded as one of the worst producers of ozone-damaging CFCs in this country. Five years ago, it reportedly released 1.5 million pounds of CFCs, more than any other plant in the nation. The shutoff came 18 months ahead of schedule, IBM officials said. The San Jose facility will now perform water-based cleaning and high-temperature drying for disk drive parts. According to IBM, it has established a goal of eliminating all CFC emissions in all manufacturing operations by the end of next year.

Short takes

Zenith Data Systems said it dropped out of the Advanced Computing Environment consortium mostly because Intel's next-generation chips are progressing much more rapidly than expected. . . . **Cyrix Corp.** cut retail prices on its FasMath math coprocessors by 60%. The new prices range from $79 to $129. . . . **Microsoft Corp.** and **Oracle Corp.** will join forces to ensure links between their products and will co-develop a driver to the Oracle database. Oracle will also contribute to the Microsoft Open Database Connectivity Specification. . . . **ICL** will resell **3Com Corp.**'s internetworking, wiring hub and terminal servers.

Imaging a role model for IBM

Unit's focus on software and services reflects Big Blue's corporate goals

BY ELLIS BOOKER
CW STAFF

CHICAGO — IBM's document imaging business, among its newest product lines, has unexpectedly evolved as a test bed for new corporate concepts at the company, according to analysts.

"Image is almost a guinea pig in the transformation of IBM," said Scott McCready, a principal at IDC/Avante Technology in Framingham, Mass.

That transformation involves an emphasis on software over hardware and on generalized business consulting and systems integration services. It also includes what even IBM officials acknowledged is an "opportunistic" approach to the technology and the fast-paced market it spawned.

"We were trying to get into a market where we were not . . . and we were trying to get there fast," said S. Craig Grant, manager of cross-platform marketing and management at the IBM Image Solutions Group.

Imaging "fits nicely with a software and services orientation," said Maureeo Early, IBM's U.S. manager of image consulting and services. According to Early, the Image Solutions Group is geared to offer full lifecycle consulting, from re-engineering business to implementing systems. She pointedly mentioned that in its consulting capacity, the company would recommend both "IBM and non-IBM components."

Takeo together, the market-driven stance of the IBM imaging group may mean dicey choices for users. For instance, IBM to date has steadfastly supported the use of OS/2 workstations for ImagePlus. In this way it toes the corporate party line in support of OS/2. Yet the undeniable popularity of Microsoft Corp.'s Windows environment and its prevalence among other imaging products appears to be forcing a change.

Significantly, IBM showed a prototype of a Windows 3.1 client for ImagePlus/2 at its booth at last month'a annual Association for Information and Image Management (AIIM) show in Anaheim, Calif.

Under pressure from a handful of top customers several years ago, IBM entered the imaging market. But it did so in what appeared to be a haphazard and somewhat uncommitted way.

Mark Morin, vice president of the Image Solutions Group, said that when he was appointed in 1986, "I had no one working for me." Morin'a organization now has a ataff of 550 workers. If IBM's imaging group still seems to he feeling its way in the marketplace, the business is doing nicely.

At a press briefing at AIIM, Morin said revenue from IBM's ImagePlus line was $605 million last yeqr.

That result reflects sales of its mainframe and midrange products, he said, predicting revenue would top $1 billion this year.

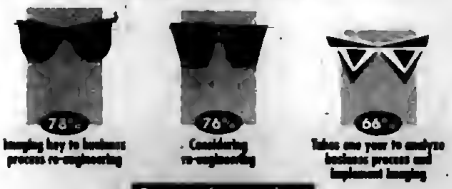
Morin said the mainframe and midrange ImagePlus products are each $300 million to $500 million businesses. He added that he saw the same potential in Unix-, local-area network—and client/server-based products — those sold directly by IBM and by its business partners.

In total, IBM claims 700 ImagePlus installations, representing approximately 450 of the Application System/400 products and 250 of the mainframe products. IBM also claims to have sold "dozens" of its Personal System/2 LAN products, which became commercially available at the start of the year.

Still, the need for an integrated product suite is a looming issue. "Customers who wanted to deploy more than one imaging platform have been, up to now, a hypothetical issue," Grant said. He added that because ImagePlus does have some core "concepts," including object orientation, communications (LU6 and Token Ring) and support for Systems Managed Storage, its pieces will work together as customers demand.

Seeking a new image

An IBM survey of user companies at the AIIM show found imaging a critical factor in achieving a competitive advantage



Base: 377 senior managers surveyed on June 23 from financial, data processing, manufacturing, utilities and government organizations

Source: IBM

Prime to split ownership of 50 Series line

BY KIM S. NASH
CW STAFF

NATICK, Mass. — Prime Computer, Inc. plans to hand over responsibility for its 50 Series hardware business — plus an interest-free loan of up to $20 million — to COPM, Inc., a new company headed by Neil McMullan, president of Prime's Computer Systems Business Unit, according to documents filed with the Securities and Exchange Commission (SEC).

The papers, filed late last month with an initial public offering for stock in Prime'a ComputerVision software unit, include the following provisions:

- COPM would be given sole rights to database/application development systems Prime Information and PI/Open, which is estimated to be worth $25 million.
- COPM and Prime would share ownership of the 50 Series, including two- and four-way multiprocessing products currently in development, known aa the Toons project.
- Prime would retain exclusive rights to service 50 Series users — both the installed base of approximately 9,700 systems and any new business COPM might generate.

If the deal goes through, Prime users such as Whitehall Co. in Norwood, Mass., would have to deal with two separate vendors: COPM for hardware and systems software and Prime for service.

The proposed agreemeot, subject to board and SEC approval, makes George Bailey, MIS director at Whitehall, a bit uneasy. One reason users have contracted for service directly with Prime rather than going to a third-party provider haa been the company'a "inside and out" knowledge of the proprietary hardware and software, Bailey said.

"I wonder whether that link will be as strong if they're two separate companies," he said.

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HEWLETT PACKARD

HP ready to fire next volley in RDBMS battle

BY JEAN S. BOZMAN
and MARK HALPER
CW STAFF

PALO ALTO, Calif. — An aggressive Hewlett-Packard Co. today hopes to answer the challenge posed by Oracle Corp. and other relational database management system vendors when it introduces a steeply discounted, faster upgrade to its AllBase/SQL relational database.

HP's revamp of its 4-year-old product includes many distributed database features that are comparable with those introduced last month in Oracle's Version 7 — and it competes with the latest wave of products from the major independent RDBMS vendors.

New features will include stored procedures, triggers, two-phase commit for on-line updating and row-level locking for data integrity. HP has included several unique features, such as database shadowing for on-line backup, which posts all recent changes in the database to a second copy of AllBase/SQL.

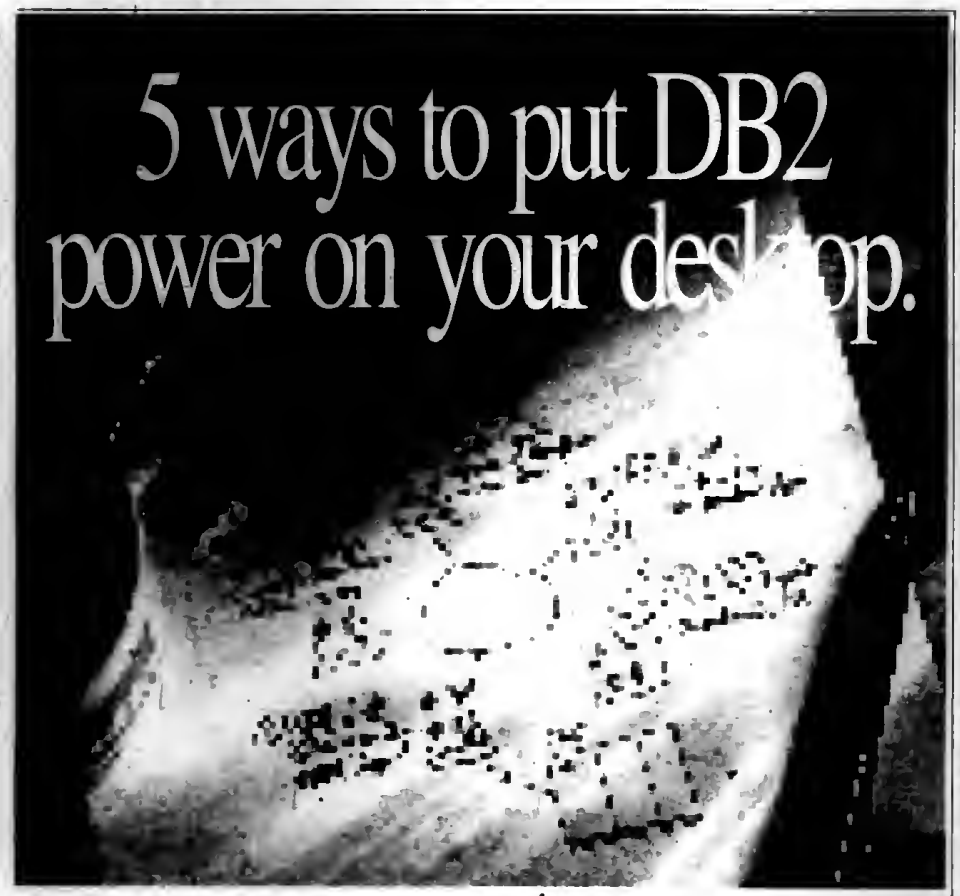
To promote sales, HP is steeply discounting AllBase in comparison with similar products. Prices range from $1,500 to $30,000, depending on system configuration. The database is currently available for HP's proprietary HP 3000 family, and it is slated to ship next month for HP's Unix-based reduced instruction set computing-based workstation and minicomputer lines.

But while HP hopes to lure database customers through its aggressive pricing, its ultimate goal with AllBase is to promote sales of HP minicomputers — both the proprietary 3000 line and the 9000 Unix series — and its Unix workstations, according to John Robertson, research and development section manager at HP.

Therefore, HP will continue to walk a fine line between promoting its own database and encouraging leading database vendors such as Oracle to write for HP platforms, Robertson said. AllBase/SQL has been tuned to provide 30% to 50% better performance than any independent RDBMS running on an HP MPE/IX or HP/UX machine, he added.

The additional speed is achieved by tightly tuning AllBase to HP's operating systems. "It has better performance because it's engineered specifically for the HP hardware," explained Donald Feinberg, a senior software analyst at Gartner Group, Inc. in Santa Clara, Calif.

However, AllBase/SQL is bound to dent the widely installed base of HP's Turbo Image database, even among all-HP shops, industry analysts said. Turbo Image, which is designed for high-speed transaction processing, has historically run faster than AllBase.



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Informix extends 4GL technology

BY JEAN S. BOZMAN
CW STAFF

MENLO PARK, Calif. — Informix Software, Inc. packed a little flexibility into its fourth-generation language (4GL), last week, announcing four extensions to its 6-year-old Informix-4GL application development language, including a graphical user interface (GUI).

Analysts said the extensions came just in time because Informix's character-based 4GL was viewed as an aging technology and a weak point in the $179 million firm's product line.

The following are the new extensions to Informix-4GL:

- Informix-4GL/GX, a 4GL that lets users deploy applications on either character-based or GUI-based screens. Pricing starts at $1,280.
- Informix-4GL for ToolBus, a version of 4GL that can be dropped into Informix's ToolBus "framework" for third-party computer-aided software engineering tools and development tools. The ToolBus technology was obtained under license from Hewlett-Packard Co. The base price is $1,200.
- Informix-4GL/RF, a version of the development language that can be used to program applications for handheld, DOS-based terminals that communicate using radio frequency. Pricing starts at $1,950.
- Informix-TP/Toolkit, a version that readies application code to run under a transaction monitor. The base price is $500.

"Informix filled a big hole in their strategic portfolio," said Neal Hill, a senior software analyst at Forrester Research, Inc. in Cambridge, Mass. "Now they've got all the key building blocks on the tool front."

Some large Informix sites were pleased to see the new software, particularly the new support for graphical workstations and the module that supports on-line transaction processing monitors such as NCR Corp.'s Tuxedo. It will be adapted to support NCR's Top End and Transarc Corp.'s Encina.

Hyatt Corp., for example, based its hotel reservation system on AT&T (now NCR) hardware and the Informix relational database.

All products are currently shipping except for the Informix-4GL/RF, which is scheduled to be available later this month.

Borland gazes through Windows

CONTINUED FROM PAGE 1

catch up with year-old initiatives from rivals Microsoft and Lotus Development Corp. targeting corporate accounts.

On the product side, Kahn has promised he will not be stingy with the whip in taking his $500 million firm into the Windows battle against behemoths Microsoft and Lotus. He has vowed to ship by the end of this summer Window's versions of the Paradox and dBase databases and Quattro Pro spreadsheet as well as a half-dozen more updates and introductions.

"We eat and sleep Windows these days," said Kahn, who clearly sees Windows as the future of Borland. Company insiders said the firm recently turned down a $3 million job from the U.S. Army for a simple port of an application to run on their Unix network. Kahn refused, fearing it would dilute the focus of programmers who were concentrating on Windows work.

Trouble is, users are wondering if the singularly driven Kahn is losing touch with what they want and what they need: a broad range of applications to accommodate their multivendor platforms (see story below).

"I just hope Borland doesn't make us a victim of their ambitions," said Bob Smiley, lead systems analyst at Matson Navigation Co., a shipping firm in San Francisco.

"I wish they'd just expand on their pluses instead of trying to take on everyone in town," said John A. Coyle, a dBase user and chartered life underwriter at Equitable Financial Cos., in Huntsville, Ala.

Wish may come true

Coyle may, in fact, get his wish. After 18 months of praising Windows with every bone in its body, Borland's enthusiasm may be waning. And for good reasons. First, the company has had difficulty meeting self-imposed — and much-ballyhooed — Windows products ship dates.

This has not been an easy thing to digest for a company that prides itself on the quickness to market that its object-oriented application development techniques afford. The lack of Windows products was cited as one of several reasons behind a $26.9 million decline in Borland's bottom line during its fiscal fourth quarter.

Even more ominous, however, is Microsoft's purchase of Fox Software, Inc. and its plans to release a Fox-developed Windows database as early as this month. After grabbing the mental high ground, with constant sneak peaks at its upcoming Paradox for Windows, Kahn is faced with his worst nightmare: Microsoft beating him to market with a Windows database.

Already, officials are downplaying the role the graphical user interface will play within Borland. Spokeswoman Sandra Hawker said Borland is an operating environment agnostic. She also cited data from Infocorp, a San Jose, Calif.-based research house, that nearly 50% of the IS community has no plans to move to Windows — ever.

Also troubling on the Windows front are early reports from beta-test users that upcoming Windows packages may be less than ideal. "Borland is focusing a lot of energy on delivering product fast, but not complete," Smiley said.

Beta-test users of Paradox for Windows also indicate that the product is incompatible with its DOS-based predecessor. "You can't port code over," Smiley said. Another beta-test user added, "If you run Paradox for Windows, you have no shot of it running with Paradox for DOS."

Similar painful stories are coming out about alpha copies of Borland's dBase compiler. "It's got some neat stuff, but they did a silly thing and left out the screen painter and report writer," said George F. Goley IV, president of Micro Endeavors, Inc., a consulting and training firm in Drexel Hill, Pa.

A similar faux pas hurt Lotus' sales of 1-2-3. Borland said this slipup will be fixed by the time the product ships late this year.

The incompatibilities are a matter of no small concern to users. "We count on these new upgraded packages to be similar because we've got a lot of time and training invested in using and integrating them," said Roland Murphy, an engineer at the Resources Conservation Co. in Bellevue, Wash.

Borland is seeking to take advantage of that investment in other ways as well. Next month, the company will roll out several sales and marketing initiatives, coupled with account visits from top company executives, in a bid to bolster Borland's visibility with IS managers [CW, June 15].

The company is attempting to rectify the situation with a series of programs that include volume licensing agreements, educational seminars and having executives "adopt an account."

Kevin Fitzsimons

Kahn's latest gig *is a mission to have Borland employees eat and sleep Windows' to fight rivals Microsoft and Lotus and ship late products*

Down to business

"Borland has had a hard time building a direct sales force. They need to do this. As the desktop becomes the fundamental base layer of the corporate computing pyramid, they need to get on the short list of MIS or else they could find themselves frozen out of some very large accounts," said Neal Hill, a senior analyst at Forrester Research, Inc. in Cambridge, Mass.

In addition, Borland does have plans for other platforms. The Unix strategy focuses around Interbase. For example, the features of the Paradox database engine and Interbase have been merged to create an enhanced database engine called Interbase Local Engine.

The Interbase database engine offers users an alternative to the Unix-based database servers and will serve as the common database engine for the Windows versions of dBase and Paradox. Borland said Paradox and dBase will be able to share data when the Windows versions of each ship later this year.

"It sounds great on paper, but I'll hold my judgment until I see something happen," said James Ramsey, a dBase user at the San Francisco police department. Borland also plans to continue DOS upgrades on all applications.

Jack Detrick, director of data processing at Centinela Hospital in Los Angeles, said scrapping dBase completely would be a mistake. "I've got a lot of dBase applications running here at the hospital, and I'm not about to . . . say we're going to convert them all to Paradox," he said. Instead, he said he would be amenable to a merged product using the dBase programming language and the Paradox interface.

Borland officials also said they plan to support IBM's OS/2. The firm recently unveiled Objectvision for OS/2 and plans to support C++ under OS/2. The company is also expected to announce its Windows New Technology strategy later this week.

Yet another thorn in Borland's side is a lengthy copyright suit with Lotus that has yet to be resolved.

By year's end, users should have a slew of new products and some outreach programs to mull over. While Kahn harkens to the scrappy start-up days of old, his user base will be watching very carefully to see if Borland has matured into the kind of reliable, broad-based and IS-minded company they need to grow with.

Users put Borland on notice

According to Borland users, the firm faces a number of challenges in the next year, chief of which are the following:

- Retain the loyalty of former Ashton-Tate Corp. customers, many of whom became nervous when Borland talked about converting them from dBase to Paradox. Borland has since backed off that strategy, but its competitors are looking to capitalize on the confusion.
- Provide easy-to-use front-end tools that allow users to perform personalized database services and access data on larger systems.
- Continue the frontal assault on Microsoft's systems business. There are rumors that Borland and Novell, Inc. are collaborating on a strategic client/server marketing strategy that might allow Borland's Interbase engine to be built into Novell's NetWare.
- Make the tutorials easier to use. "We're getting very complex and leaving a lot of people behind," said John A. Coyle, a dBase user and chartered life underwriter at Equitable Financial. "It's one thing to bring out a new product. It's another to get it used."
- Move on hints that it is working with Apple on a database.

In particular, those rumors have been warmly greeted by users struggling to bridge interoperability gaps inherent in many multiplatform environments. They would like to see Borland take advantage of the graphical Macintosh interface; make it a relational, rather than a flat-file, database; provide connectivity to Paradox for DOS and Paradox for Windows; provide a feature similar to SQL Link, a Paradox Version 3.5 companion product that allows users to access remote SQL data without learning complex SQL programming; and leverage client/server connectivity to Interbase, which offers a relational database management system for multiuser environments.

Helping hands

Borland CEO Philippe Kahn has broadly hinted that he would like to continue partnering with other companies. "We're willing to help our competitors, even if it does mean giving away some technology."

This strategy may include a linkup with Novell, Inc., although that move might only be used to scare off a common enemy: Microsoft.

"There is an old saying that the enemy of my enemy is my friend," said Dataquest, Inc. analyst Paul Cubbage. "Borland [applications] and Novell [networking operating systems] face a very real threat in Microsoft."

There is also talk that Borland may help provide tools for the forthcoming object-oriented operating system from Taligent, Inc., the joint venture between IBM and Apple Computer, Inc.

And next month, Borland will roll out the first of a half-dozen planned partnerships with systems integrators as it strives to raise its profile among IS managers.

JAMES DALY

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Smart food

■ No, you can't eat this one and it doesn't build strong bodies, but it could build smart computers. One of the experiments scheduled to be carried out on the flight of the space shuttle Columbia, launched June 25, involved a smart protein believed to have potential as computer memory material. Several educational institutions and companies were sponsoring the research into the commercial viability of the light-harvesting protein bacteriorhodopsin in computer memory applications. Researchers hope the material can be used in the future to build optical three-dimensional memory storing 18G bytes of information in a storage device measuring only 5 cubic centimeters.

Real deal

■ Cray Research, Inc. and Modular Computer Systems, Inc. (Modcomp) have signed an agreement under which Fort Lauderdale, Fla.-based Modcomp will license its REAL/IX real-time operating system technology to Cray. The companies plan to collaborate in developing system software to support real-time applications on the Cray Y-MP EL supercomputer. Cray also announced an agreement with Applied Dynamics International, Inc. in Ann Arbor, Mich., under which Cray and Applied Dynamics will develop and jointly market real-time computer simulation products.

Raising Arizona

■ Attempts to simulate the growth of semiconductor crystals are under way at Arizona State University. The school recently installed a Convex Computer Corp. C3400 supercomputer to simulate growth of crystals for silicon and gallium arsenide semiconductors. The computer will attack equations of theoretical physics to predict physical and chemical reactions as new super chips are developed. It will then produce a videotape of super chip growth.

Letting the robot take the plunge

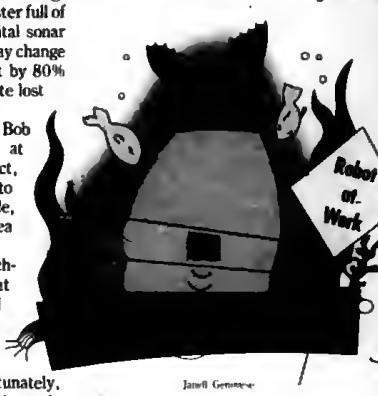
AT&T sonar system scans ocean floor for lost cables and buried treasures

BY ELISABETH HORWITT
CW STAFF

Searching for things on the ocean floor can be a frustrating and time-consuming job, whether the object in question is a lost fiber-optic cable segment, an oil pipeline or a canister full of radioactive waste. But a digital sonar device developed by AT&T may change all that. It is expected to cut by 80% the total time it takes to locate lost and severed cables.

For example, according to Bob Bannon, a senior engineer at AT&T who directed the project, it currently takes AT&T two to four hours to locate a lost cable, depending on weather and sea conditions.

Current cable-finding technology includes devices that sense a cable's magnetic field and analog sonar that bounces analog waves off the ocean floor and analyzes the resulting echoes. Unfortunately, magnetic sensing generally misses the small-diameter fiber-optic cables on which international data comunications often rely. Meanwhile, analog waves tend to be absorbed by the boulders, rocks and gaseous clays on the ocean floor, Bannon said.



Janell Genovese

Chirping away

In contrast, an AT&T Bell Laboratories-patented technology called digital signal processing sends digital pulse "chirps" that pierce through rock and clay to locate objects far more quickly and accurately, AT&T said. AT&T has incorporated that technology into a prototype system called Enhanced Bottom Sonar System (EBSS). The system rides in a remotely operated vehicle (ROV) that travels underwater sending out digital chirps. The chirps bounce off the sea floor, and the return signal is picked up by the system, which converts it into digital information.

"You see various contours [of the sea bottom], and when [EBSS] sees something lying on the surface, it gives you an acoustic signature," Bannon said.

The ROV system sends information to a shipboard AT&T Intel Corp. 1486-based StarServer S workstation, which refers to a library of signatures to determine what type of object has been spotted on the ocean floor.

Although the device was developed to find lost cable segments, the technology might also be used to find "special objects," such as the black box from the Air India plane that went down off the coast of Ireland or even gas pockets or rock strata with oil for the energy industries, Bannon said.

Underwater progress

"Everything we've seen to date shows that this is one of the most promising technologies for locating things underwater to come along in years," said Godik Gyldenege, manager of government and commercial programs at Oceaneering Technologies, which has given AT&T input on the application of digital sonar.

Oceaneering Technologies has concluded that EBSS "has a demonstrated ability to locate continuous things like cable and oil pipelines," Gyldenege said. "Once it is productized, we would be very interested in buying it" as an aid in the company's work for oil and gas companies.

On the other hand, digital sonar has yet to prove its ability to locate isolated objects, such as canisters or rock strata that contain oil, Gyldenege said. "Working underwater is a tricky, difficult process."

AT&T is using EBSS in its own cable recovery services. The company has no time frame for announcing commercial availability, Bannon said.

The next phase of the EBSS project is to miniaturize the system so that it can be installed in smaller ROVs.

Applications become clearer with fuzzy logic

BY CHRISTOPHER LINDQUIST
CW STAFF

Very little in life is black and white, but computers have a tendency to make us solve problems that way. Now, Knoxville, Tenn.-based FuziWare, Inc. is producing fuzzy logic applications that circumvent some of the restrictiveness of traditional binary solutions.

FuziWare's products, such as FuziQuote and the soon-to-be released FuziCalc, allow users to establish "fuzzy" values for activities such as determining the per-piece price on manufactured goods. Users can input hard data, such as costs of raw materials and tooling, and then add fuzzy values for such things as "How much do we want this job?" and "How busy are we at the moment?" The effect of fuzzy information on the equation is determined by historical data, embedded knowledge from experienced employees and "current insight" into the situation at the moment the quote is made.

The result is an accurate quote made in less time than would normally be required to pass proposals in front of all the required employees and shorter response times to customer requests.

"With our quoting, a lot of the numbers that we would come up with were best guess," said Laney Fowler, vice president of sales and marketing at Foremost Manufacturing Co., a formed metal fabricator in Union, N.J. FuziQuote allows the firm to input ranges instead of crisp numbers and include abstract information.

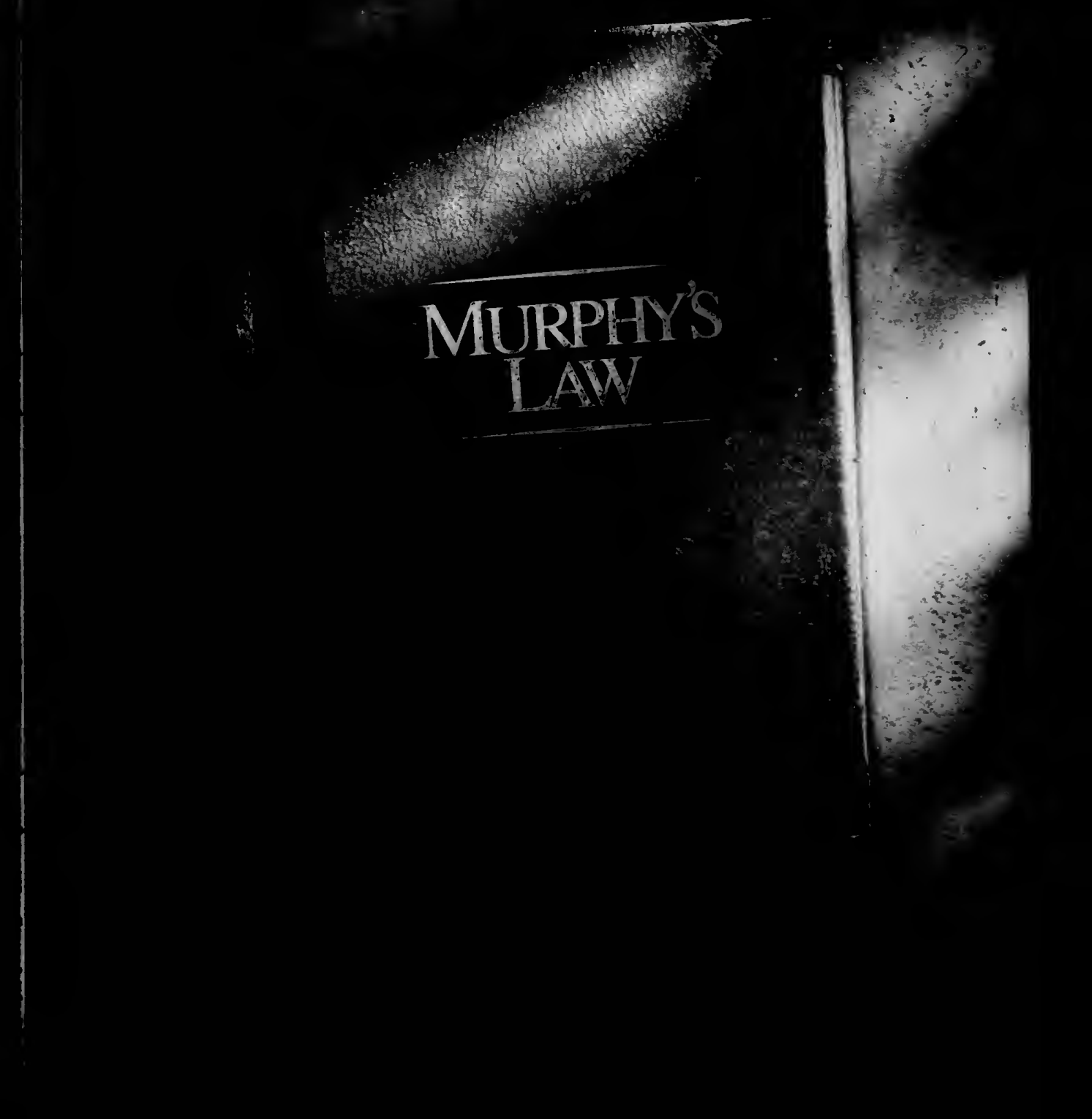
FuziQuote also eliminates the need for the company to gather all its employees with quoting experience each time a bid has to be calculated.

FuziCalc takes the fuzzy logic idea even further into the realm of general use. Users are presented with a common Windows-based spreadsheet interface into which they can add both hard and fuzzy data. Fuzzy numbers are represented by a chart that can be directly manipulated by the user. Users can pick a range of acceptable or probable answers and also establish a "desirability" level from "0" (unacceptable) to "1" (totally acceptable).

For example, an application that might be used to determine possible cities for a new plant might include such factors as city size, number of available airline flights and temperature. By adjusting a graph for each factor, a user might indicate that cities having between 500,000 and 3 million residents, at least 15 flights per day and an average temperature of 50 to 70 degrees Fahrenheit are suitable.

FuziCalc will be available later this summer for a list price of $995.

DELL INTRODUCES A CONCEPT SO REVOLUTIONARY, IT BREAKS EVERY LAW IN THE BOOK.



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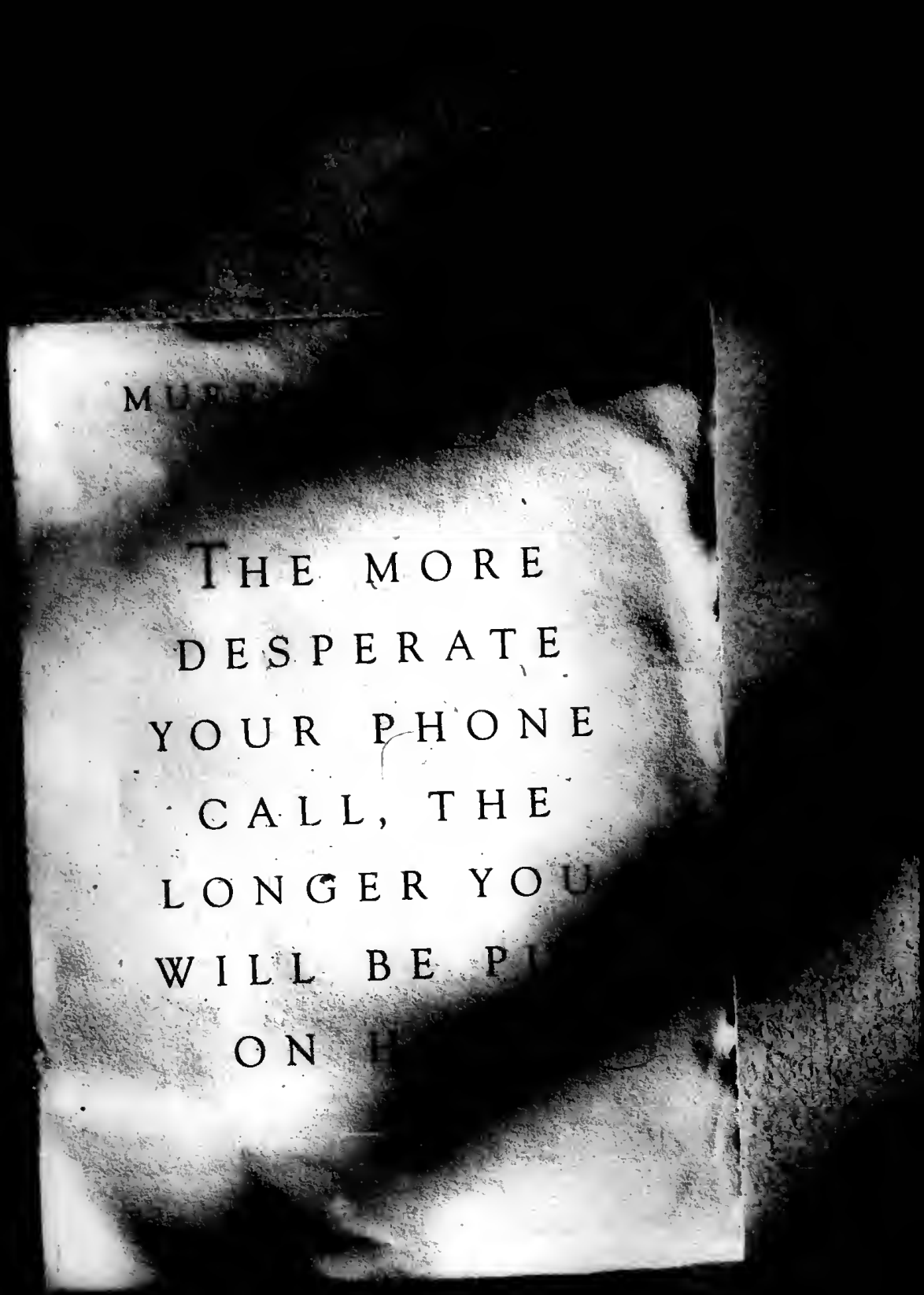
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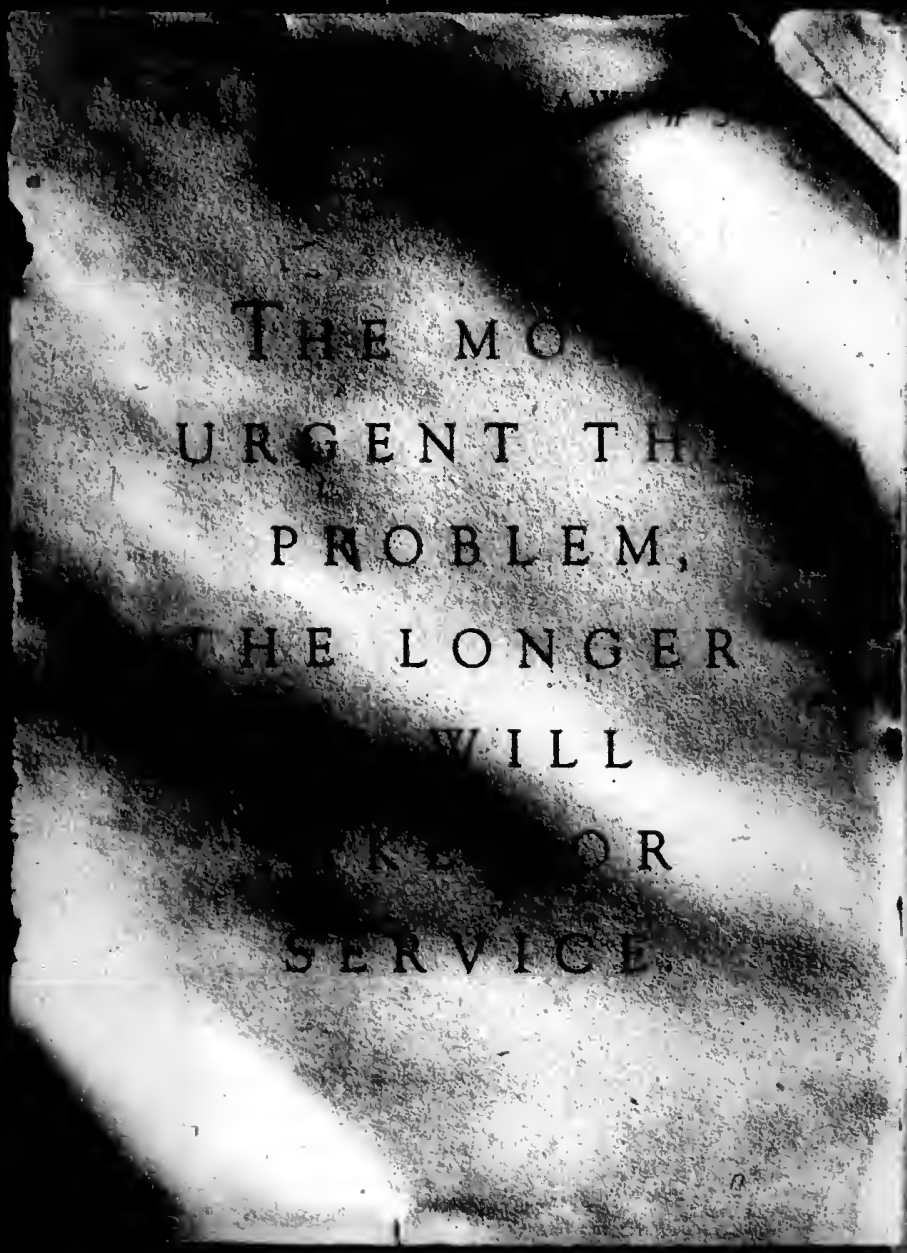
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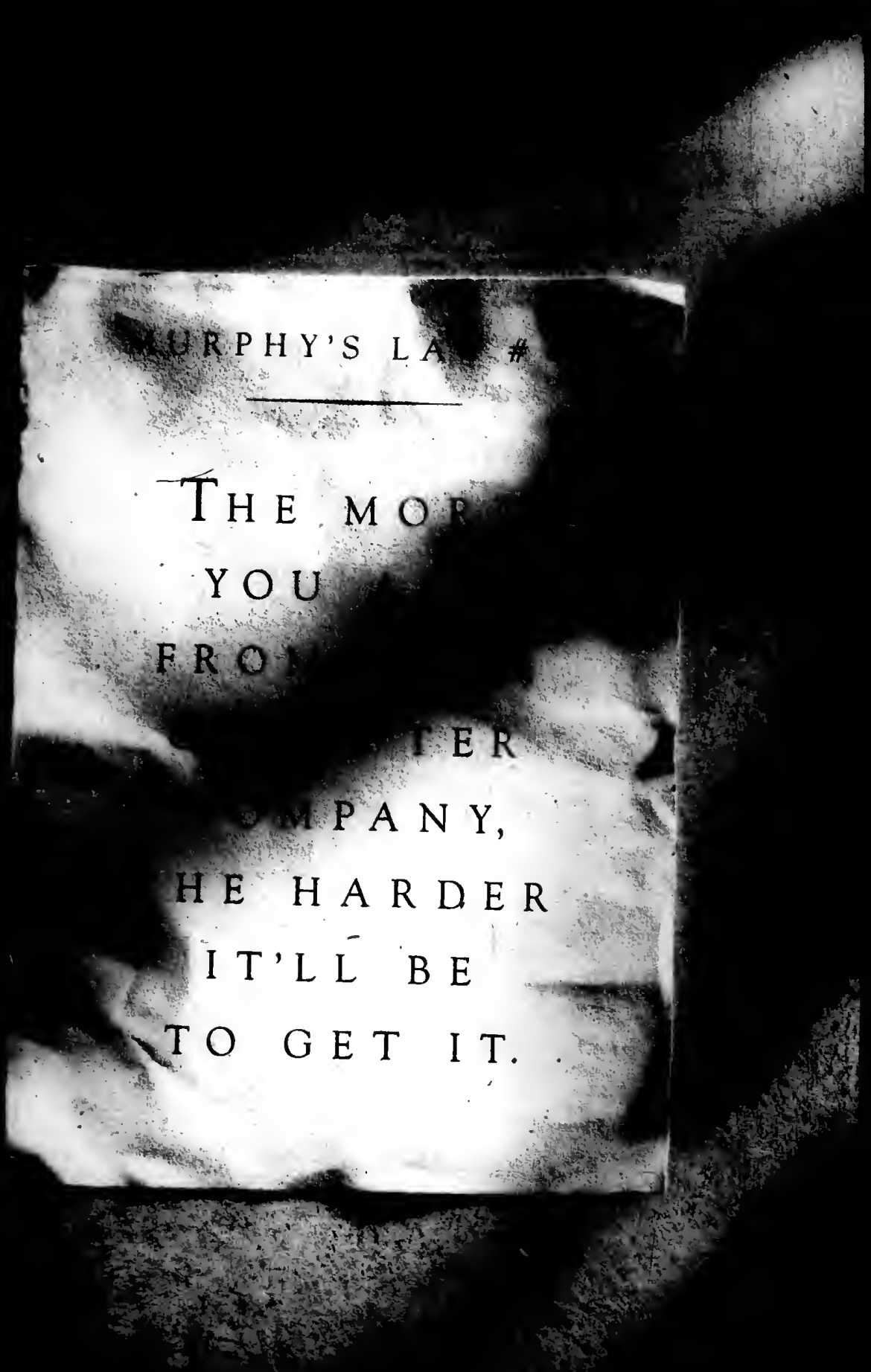
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EDITORIAL

Making up grades

To read the papers lately, you could conclude that what's going on in the market is the great once-in-a-lifetime, sell out to the bare walls, PC price-cutting mother of all high-tech basement sales, buy it now while it's so cheap splurge-a-rama.

To further entice and induce corporate buyers, vendors are all but giving away those memory-hogging graphical operating environments. With the hardware so dang cheap, the world of GUIs so attainable, what is there to keep corporate buyers from doing their part to help this country spend its way out of the recession?

The answer for many big users is the experience with what has been billed as a reasonably painless process: namely, upgrading.

At a recent Microcomputer Managers Association meeting, corporate PC chiefs swapped stories of their "painless" upgrade experiences. They were perhaps best summed up by one manager from a financial services firm, who said, "It's harder than you think, it takes longer, and it costs more than you'll be told."

It cost one of the managers greater than $1,000 per user to upgrade 50 users to the wonderful world of GUIs. These users had pretty modern hardware to start with, so the iron upgrades were under $10,000, while the operating system costs were far less. So where'd the money go? Three-fourths was spent on upgrading applications and in training the users, that's where.

While the manager says he believes the upgrade journey will prove to be worth the pain, he was quick to add that the GUI vendor had "published claims showing tremendous benefits of GUIs, and they haven't been replicated since." In other words, *caveat emptor*.

If the PC vendors would just look at their own research more closely they'd discover that on the corporate buyer's list of purchase influences, price is third or fourth — or lower. Their needs are more elementary and — in some cases, perhaps — contrary to the goals of the vendors.

For example, managers are having a very difficult time distributing software upgrades, especially when end users number in the hundreds or thousands. Tracking the many and varied software license provisions is another expansive headache. What they want here is seamless electronic distribution and simpler, if not more liberal, license language. To date, there has been talk about filling these needs, but not much action.

Many PC vendors, who have historically sold their products through third parties with little direct contact with corporate buyers, privately express frustration with what they perceive to be buyers' recalcitrance within the IS community. What they are really hearing is the voice of experience.

Bill Laberis

Bill Laberis, *Editor in chief*

LETTERS TO THE EDITOR

Grand delusions

Chris Goggans ["Hackers aren't the real enemy," Viewpoint, June 8] hardly rates serious attention or acclaim as a threat to the world's computer networks or even as a clever programmer.

First of all, Internet has long been established as an open network for use by the public and academia. For all his delusions of grandeur, Goggans' feat of breaching Internet is the equivalent of sneaking in the back door of someone's house while there is a huge party going on.

My advice to this young man is to spend some time reading the U.S. Constitution to gain an understanding of the meaning of the right to privacy. If this fails to make an impression, perhaps what is needed is for someone to walk into his home, raid the fridge, make a few long-distance phone calls, then borrow his car "to learn how it works in minute detail."

David Park
New York

Big Blue backer calls for reality check

Regarding the commentary by Chris Lindquist, "Bitter taste of real world" [CW, June 8]: It's been my dream to be able to develop applications for the Japanese version of DOS here in the U.S., so when OS/2 2.0 came out with the capability to launch multiple versions of DOS, I decided to call the 800 number to ask if it supported DOS "V," the Japanese version of PC-DOS.

The people at IBM were courteous, polite and willing to help. They took my name and phone number and assigned me a problem ID to which I could refer when making follow-up calls.

They called me the next day to let me know the question was being investigated. Several weeks later they called me to tell me the answer I was looking for: the Japanese version of OS/2 2.0 would support both American and Japanese DOS on an American hardware setup.

I have only good things to say about IBM's support number, except that it's a shame Lindquist omitted the one thing he should have done to get his problem solved. This indicates to me that Lindquist ultimately failed to be a "real user."

Shoji Mizumoto
The Sakura Bank Ltd.
New York

Tax factors may discourage contractors

Regarding "Laid off? Try captaining your own ship" [CW, May 25]: This advice would have been good prior to the passage of Section 1706 of the tax code. It is far outdated now.

The advice given by David Baum would result in no work, because employers are frightened of hiring independent contractors. The IRS could question the independent status of the contractor from more than 20 common law elements of independence, most of which are inappropriate in a mainframe, team-structured environment. The excessive fines fall on the employer and the employee.

We can blame this state of affairs on that "outsider," Ross Perot, who got the legislation passed by his friend Sen. Patrick Moynihan, to his own great profit and to the detriment of all programming entrepreneurs. I urge all readers to lobby their legislators for the repeal of this law.

William S. Pirone
Woodland Hills, Calif.

Rental firm responds: The Hertz truth

"Hertz mulls outsourcing rescue" [CW, June 22] suggests Hertz is a desperate company seeking a cash infusion. Hertz is a financially secure, competitively strong company. As with any well-run company, management is always looking for ways to improve productivity and reduce costs. To that end, Hertz has analyzed its IS costs and is considering outsourcing some, but not all, of its data center.

Also, no study for Hertz has ever concluded that outsourcing would cost more. Moreover, Hertz will not sell software or hardware assets to improve cash flow or for any other reason.

We are No. 1 in our industry, and as our ranking in *Computerworld*'s Premier 100 listing has established, we are also No. 1 in the car rental industry for the effective use of management information systems.

We will certainly do nothing to change that.

Gary D. Orrell
Staff Vice President MIS
The Hertz Corp.

Computerworld welcomes comments from its readers. Letters may be edited for brevity and clarity and should be addressed to Bill Laberis, Editor in Chief, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701. Fax number: (508) 875-8931; MCI Mail: COMPUTERWORLD. Please include a phone number for verification.

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Hurrah for the 'Second Circuit'

PHILIPPE KAHN

If you follow the computer industry, you've probably read at least something about the issue of software copyrightability. Personally, I'm not much for reading legal briefs, but due to a number of companies that believe competitive battles should be fought in the courtroom, I have been forced to read more than my share.

This is a computer book, not a legal journal, so I'll spare you the legal jargon and just get right to the point: Right now, our industry is facing an issue that is absolutely critical to the future health of the U.S. computer industry.

Innovation has been the driving force that has made us a world leader in software. But that advantage is being threatened by companies trying to overextend copyright protection to guard their own interests.

Last week, the Federal Court of Appeals in the prestigious "Second Circuit" published a landmark decision on the standards for copyright protection of computer software. The decision is a huge victory for everyone concerned with the future and health of the U.S. computer industry.

Finally, the courts have made a strong statement to corporations that choose to use the legal system as a competitive stumbling block, rather than competing with technological innovation and straightforward, aggressive marketing.

A matter of balance

In its decision, the Court of Appeals made it clear that the results reached by other courts on this issue were "less than satisfactory." In the case of *Computer Associates v. Altai*, the court issued a ruling that specifically recognizes "the necessary balance between creative incentive and industrial competition."

We were very pleased with the court's position that aspects of a computer program that are dictated by considerations of efficiency and factors external to the program itself or taken from the public domain are not protectable.

The ruling reflects the basic tenets of copyright law, and this is a position that Borland has long held.

I believe that the most important aspect of the Altai decision is its clear declaration that "compatibility" is not a dirty word. The court stated that aspects of a program's structure that are "dictated by the nature of other programs with which it was designed to interact" are not protected by copyright legislation.

The court felt it was important to allow the distribution of a "compatibilty component" of a computer program because that aspect "saves the user the costs, both in time and money, that would otherwise be expended in purchasing new programs, modifying existing systems to run them and gaining familiarity with their operation."

For those of you who follow Borland and use our products, the court's statement might look familiar, because it contains the essence of several advertisements for our Quattro Pro spreadsheet.

We hope the importance of the Altai decision becomes clear to everyone in the industry and to all of our customers.

Much at stake

If these cases were to be decided the other way, they could seriously damage a large portion of the American computer and software industry — those companies lawfully engaged in the making of compatible products.

The Second Circuit's overriding concern was "the preservation of the balance between competition and protection." "The interest of copyright law," the court said, "is not simply conferring a monopoly on industrious persons, but advancing the public welfare through rewarding artistic creativity. . . ."

Unfortunately, however, the battle does not end with the Altai case. We hope the Second Circuit's decision in Altai becomes a road map that other courts choose to follow, but unless and until the U.S. Supreme Court decides the issue, there is no requirement that they do so.

Kahn is chairman and chief executive officer of Borland International, Inc.

Call off the hostilities: There's a lot of work to do

DAVID VASKEVITCH

Which would you rather have: style or substance?

Our mainframes contain large data-based applications that run fast and offer complete reliability. Yet these applications have hostile front ends that make it almost impossible to find data quickly or integrate it into the spreadsheets and word processors we've all grown to know and love. Desktop PCs offer slick, friendly applications that integrate easily with all those tools. However, PC applications deal only with the data you type in or load from a floppy disk and provide no way to access the information the organization runs on.

Great choice: lots of substance but terrible appearance, or great superficial appearance but no underlying substance.

Database vs. interface

At the heart of this dilemma is the fact that most IS departments are split into two camps, with completely different cultures: mainframers centered around their databases and PC developers focused on the user interface.

As a result, we see proposals for client/server application development where even the suggestion that some data might stay in DB2 or IMS is viewed as religious heresy. And Cobol-based systems organizations actively look for inconsequential projects that can be built on LANs without getting in the way of any real applications.

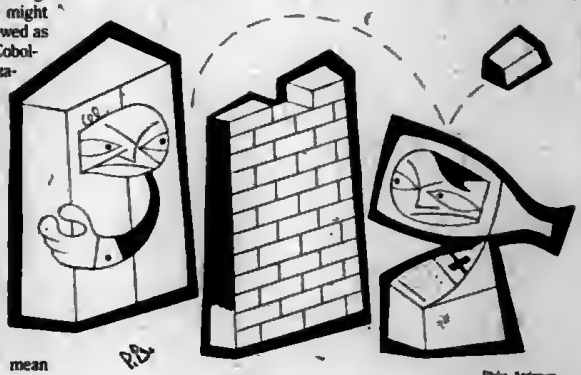
What we have here are two cultures that, at best, just don't understand each other and, at worst, are sometimes at war.

When mainframe professionals talk about databases, they mean DB2, IMS and Rdb — storage and retrieval engines built to support thousands of simultaneous users while safeguarding data through power failures and disk crashes. But for PCers, databases are products such as dBase, Paradox and DataEase — workstation-resident development tools built for single users.

Supporting eight simultaneous users is a significant accomplishment for these lightweight engines, while integrity is generally defined in terms of being able to retreat to the last backup.

The two communities generally are not even talking in the same terms. What a PCer thinks of as a DBMS a mainframer would call a 4GL. When it comes to database design tools, the cultural disconnect gets worse.

Mainframe-trained, data-oriented developers have the tools and understanding to build the big, serious applications that contain the data our organizations run on. What about accessing that data, though?



Philip Anderson

Mainframe developers think in terms of 3270 screens and data entry fields — an environment where the central computer controls the entire interaction. To them, interface design means deciding the order in which the user moves through a relatively fixed set of static forms.

Concepts such as Direct Manipulation and WYSIWYG, which lie at the center of modern GUIs, have no meaning for mainframers. Just as PCers lack the basic concepts and experience to think about database design, mainframe developers lack the fundamental framework to conceptualize, let alone build, truly graphical and friendly interfaces.

So we're left with two fundamentally different cultures, both critical to building the applications of the '90s.

This schism isn't going to be easy to close. The problem runs deeper than concepts, tools and vocabularies. Each group has an almost religious belief in the correctness of its own approach.

Fortunately, there's a saving grace: Scratch any dedicated computer professional and you'll find a hacker underneath. The challenge is to help each side see the promise and the value in what the other knows.

Vaskevitch is director of strategic services for Microsoft Consulting Services at Microsoft Corp. in Redmond, Wash.

Show me a new workstation with better numbers, and you'll get my attention.

Show me one with better ideas, and you'll get my order.

Introducing SPARCstation 10.

The new SPARCstation™ 10 system is four times more powerful than any workstation we've ever made.

Not only that, we also think you'll find it a hundred times more interesting than any workstation anyone else has ever made.

More interesting, because it runs your applications better than other desktops. Because you can upgrade to future processors about as easily as you can change a light bulb.

And because it doesn't trade off backward compatibility for the sake of forward thinking.

In other words, the Sun™ SPARCstation 10 is not just a new model.

It's an entirely new computer.

The only performance that matters.

With each of the SPARCstation 10 models, ranging from 86 to over 400 MIPS, you'll find we've asked a single question:

What good is a turbo-powered engine if the car's transmission is sluggish? Or if its tires are flat?

Our point is that building faster CPUs makes very little difference if the rest of the computer can't keep up.

So the SPARCstation 10 possesses not only a faster CPU, but also a faster system bus, faster input/output, faster networking, and built-in multiprocessing.

The faster CPU is our remarkable — and reassuring — new SuperSPARC™ chip.

Reassuring, because SuperSPARC is binary compatible with previous generations of SPARC.® It runs the Solaris® operating environment, too, so you can use thousands of existing applications.

And remarkable, because SuperSPARC can handle three instructions at once (most others manage only one or two). Imagine what that does for sheer processing speed.

Now here's where things really start cooking:

We teamed all that horsepower with the extra performance of multiprocessing. One megabyte of SuperCache™ memory. A 320-megabyte-per-second peak memory bandwidth. A 10-megabyte-per-second SCSI disk controller. And a large I/O buffer for faster Ethernet transfers.

Individually, each of these represents a big step forward in computing performance. But together they produce an astonishing leap ahead in application performance.

And to the person whose hands are on the keyboard, that's the only kind that matters.

Growing up vs. growing old.

Though budgets have never been tighter, most workstations are still designed around the wasteful belief that you're willing to replace last year's computer just to work with a newer processor.

The SPARCstation 10 was designed around a different philosophy:

Make the processor replaceable, not the workstation.

To that end, we put the processor on a small SPARC module that plugs into the motherboard. As faster chips become available, you can upgrade by pulling out the old card and plugging in a new one.

The rest of your investment — memory, storage, accelerators, everything — is left intact.

But don't feel you have to wait around for faster chips. You have the freedom to grow a SPARCstation 10 in plenty of ways right now.

You can start by plugging in a second SPARC module. Since this machine was engineered throughout for symmetric multiprocessing, you'll nearly double its processing power.

You can also boost its memory to 512 megabytes. And its disk capacity to 26 gigabytes.

There are ports for both parallel and serial devices; connections for thick, thin, or twisted-pair Ethernet; even ISDN connectors for networking over public telephone lines. All built in. Which leaves its four expansion slots available for other functions.

To sum up, we hope you like the way SPARCstation 10 looks on your desk.

Because it's going to be there quite a while.

The future is not an option.

As innovative as computer companies try to be, they usually can't keep up with what people like you are ready for.

For instance, how long have you been hearing about promising new technologies like multiprocessing? Multimedia? ISDN?

And how many workstations can you name that give you every one of those capabilities, right out of the box?

There's only one.

Multiprocessing Performance

You've already read how the SPARCstation 10's multiprocessing can speed up the applications you run today. But it also means you can add enough horsepower later to run next-generation software built around multithreading and object management.

And then there's ISDN. It brings the worldwide telephone network directly into the Sun SPARCstation 10 — without modems or other gadgets. Which allows applications to make faxing, voicemail, and even video conferencing as natural as printing.

Plug-In SPARC Modules

A 16-bit audio chip and external speaker are also included. So applications can use CD-quality sound for e-mail, spoken tutorials, and multimedia presentations.

And there's enough memory, disk space, and bus bandwidth to meet the enormous demands of animation, simulations, and real-time video.

Binary Compatible

Oh sure, there are plenty of options you can add to this computer.

The future, though, is standard equipment.

Admit it, you're intrigued.

You can't have read this far without feeling at least a twinge of excitement.

Maybe it's for the swift kick-in-the-pants this machine can give to the applications that you're already running today.

Or the enthusiastic way it welcomes whatever new technologies may be around the corner.

Maybe you simply can't help but respect a computer that offers your business a lot more than just MIPS and MFLOPS.

Whatever you think, here's what to do:

Call 1-800-426-5321, ext. 485 for complete information on the SPARCstation 10, or the name of your Sun reseller or sales representative.

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If a new PS/2 56 or 57 interests you, running twice as fast on one should, too.

Application	Test*	PS/2 56/57 w/ 4MB RAM w/ Windows 3.1 & MS-DOS 5	Standard configuration PS/2 56/57 w/ 4MB RAM w/ OS/2 2.0	Times Faster
		Time in seconds	Time in seconds	
Microsoft Excel 4.0 for Windows	File Load	7.3	53.8	7.4
Lotus® 1-2-3® for Windows	Application Load	21.5	134.8	6.3
Ami Pro™ 2.0 for Windows	Print	18.0	110.0	6.1
WordPerfect® 5.1 for Windows	Spellcheck	12.7	26.4	2.1

If you're like most people, you probably use applications for the Microsoft® Windows™ operating system. But if you happen to get the standard configuration PS/2® 56 or 57 with OS/2® 2.0 these days, you might notice that your programs run at substandard speeds.

What's the solution? New Microsoft Windows & MS-DOS® 5 for IBM® PS/2.

We've combined MS-DOS 5 and Windows 3.1 in a single installation specifically designed for the IBM PS/2. Which means you can run most of your applications for Windows twice as fast, and in many cases over five times as fast, as the standard configuration PS/2 56 and 57 allow.

Through 1992, the Windows and MS-DOS 5 package is $149.95.** It's easy to install for yourself. Or ask your IBM reseller to install it for you on the new IBM PS/2 of your choice.

To get the facts on Windows and OS/2, give us a call at (800) 541-1261, Department HG8. We'll be happy to help you get up to speed.

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*Tests measure performance in operations commonly selected by industry publications, including PC Magazine, InfoWorld and PC WORLD, for evaluation of word processing and spreadsheet applications. Actual test files used conform to descriptions contained in PC WORLD evaluations. Tests were performed by an independent third party. Spreadsheet File Load: Time from issuance of File Open command to time user regained control of the application, based on loading a file with 253 months of assets and liabilities. Spreadsheet Application Load: The time it takes to load an application. The test was timed from when the icon was double-clicked to when the user regained control of the application. (Under the OS/2 test, the time was measured based on beginning from an OS/2 desktop.) Word Processor Print: The time it took to print a one-page document containing two text columns and a TIFF image. The test was timed from when the print command was issued until the user regained control of the application. Word Processor Spellcheck: Time required to spellcheck an 11-page document with no spelling errors. Test was timed from when the Spellcheck command was issued until the user regained control of the application. **Suggested retail price. Reseller prices may vary. For more information, call (800) 541-1261, Dept. HG8. Outside the U.S. and Canada, call (206) 936-8661. In Canada, call (800) 563-9048.* © 1992 Microsoft Corporation. All rights reserved. Printed in the USA. Microsoft and MS-DOS are registered trademarks and Windows is a trademark of Microsoft Corporation. IBM, OS/2 and PS/2 are registered trademarks of International Business Machines Corporation. Lotus and 1-2-3 are registered trademarks of Lotus Development Corporation. Ami Pro is a trademark of Samna Corporation, a wholly-owned subsidiary of Lotus Development Corporation. WordPerfect is a registered trademark of WordPerfect Corporation.

Undercutting Compaq: NEC joins the fray

BY CAROL HILDEBRAND
CW STAFF

Another predator has joined the price-cutting frenzy following Compaq Computer Corp.'s landmark product/price blitz in mid-June.

NEC Technologies, Inc. announced across-the-board price reductions on its entire families of PowerMate desktop, UltraLite notebook and ProSpeed laptop computers.

The company, in another nod to the Compaq announcement, will provide free one-year, on-site service for the desktop machines.

Not premeditated

Michael Everett, marketing manager for desktop systems at NEC, acknowledged that Compaq's actions were the reason for NEC's follow-up. "We were not planning on cutting prices before that Compaq announcement," he said.

Everett echoed analysts' predictions that the collapse of the price umbrella previously held up by Compaq, IBM and Apple Computer, Inc. would drive many smaller competitors out of business.

"If we were a company that didn't have the financial resources of NEC, it would be very difficult out there. The more marginal manufacturers are going to be the ones that lose. They need economies of scale and manufacturing," Everett said.

He also said NEC has now cut its product cycle down to six to eight months, which is another crucial factor.

Beating the competition

NEC prices dipped to an average of 5% to 10% below Compaq's. For example, NEC's PowerMate 486/50I with a 120M-byte hard drive is now $2,749, a $950 price cut. Compaq's similarly configured model is $3,669, Everett said.

In the PowerMate family, prices now range from $1,099 for a 20-MHz 80386-based model with a 60M-byte hard drive to $7,749 for an Extended Industry Standard Architecture-based 50-MHz I486-based box with a 535M-byte hard drive.

Notebook systems dipped as low as $2,199 for an UltraLite SL/25C, while a 486SX ProSpeed laptop is now priced at $4,799.

Step by step, bank moves 1,500 to OS/2

Huntington Bancshares' implementation plan calls for full conversion to OS/2 2.0 in 18 months

BY ROSEMARY HAMILTON
CW STAFF

COLUMBUS, Ohio — It starts with a group of 10, expands to a group of 500 and will eventually spread out to close to 1,500 users.

That is the easy way to explain Huntington Bancshares, Inc.'s deployment of IBM's OS/2 2.0. But the actual implementation process involves far more time, energy and patience, according to Cary Serif, manager of applied technology at the bank.

To make the shift to 2.0, Huntington put together the following plan: Work with a small group of users to determine migration and training issues.

Once the issues are established, move ahead with 2.0 installations based on priority software projects at the bank.

At the same time, individual users can request upgrades to 2.0, but "the first priority is projects," Serif said.

"With respect to the end users, we are having monthly meetings to show people what 2.0 is all about," Serif added.

"The deployment is driven more by the bigger projects in the bank," Serif added. "If it's considered a critical application, then it gets priority."

500 ahead

Two projects topping the list are a branch automation and executive information system. The branch automation system involves about 500 users. Serif said this group will be upgraded to 2.0 once the tests are completed with the group of 10.

When IBM shipped the final version of 2.0 in March, Huntington put together the small test group to determine what its users would need for support and training.

Testing is still under way, and Serif could not say when it would be wrapped up.

So far, the test group has shown that for end users to receive satisfactory performance for 2.0, each workstation will require about 8M bytes of storage.

Technically, users could get by with 4M to 6M bytes of storage, but "we don't want to put 2.0 up and have people impacted because they don't have enough memory," Serif said.

Also, many desktops at Huntington are 80286-based and will need to be boosted up to 80386-class systems, which Serif said may be done with add-on boards.

> "THE DEPLOYMENT is driven more by the bigger projects in the bank. . . . If it's considered a critical application, then it gets priority."
>
> CARY SERIF
> HUNTINGTON BANCSHARES

With these hardware upgrades rolled in, Serif estimated that the average upgrade will cost about $1,000 per system.

The test group includes a mix of Microsoft Corp. DOS and OS/2 1.3 users so the bank can determine what the different migration and training issues will be.

In addition, among the 10 are users from various pockets of the company so the bank's population is fairly represented.

So far, the group has shown that DOS and 1.3 users will require a good deal of support, in part because 2.0 opens up so many new options for them.

"Because 2.0 is so much more functional that 1.3 or DOS, there's going to be a lot more questions," Serif said.

Subtle persuasion

DOS users may still need a little convincing that 2.0 could help boost their productivity, Serif said.

"The intention with the DOS people is to help really open their eyes," he added.

Huntington's Information Resource Center recently completed a 2.0 training program to be ready to assist end users.

As testing continues with the group of 10, Serif said, the 500 users on the branch banking project are a top concern. "This group has a little more priority, because it's a very important project to the bank."

Finally, Serif said, he expects 1,000 to 1,500 end users will be up and running with 2.0 within the "next 12 to 18 months."

The portable that had to fit in the sales rep's purse

BY MICHAEL FITZGERALD
CW STAFF

SAN FRANCISCO — Sales representatives at Pacific Bell Directory let their fingers do the walking — on a keyboard from Fujitsu Personal Systems, Inc.'s Poqet computer.

Two motives drove the choice of the 1-pound portables: a management mandate to bring technology into the business and a sales representative's desire to have a computer that fit in her purse.

"To me, we could provide more information much easier and in the process could increase our accuracy because everything would be more up to date," said Stuart Graham, then director of operations and sales support.

Updates to sales data, which were done quarterly with a paper system, as well as periodic specials, occur monthly with the computerized systems, Graham said.

The Poqet project became an offshoot of a four-year, $200 million project aimed largely at the internal telemarketing group.

"Upper management said as a company we had to [automate] since we're moving into a technological era," said Bill Bozym, an information systems planning and technology assessment specialist at Pacific Bell Directory, a subsidiary of Pacific Bell.

The search for small systems came from practical reasons. "These sales reps carry around a lot of stuff with them, and one female manager said she wanted to be able to put the computer in her purse," Bozym said. The Poqet machines measure roughly 8½ by 4¼ in.

So Bozym pulled out his microscope. He looked first at Atari Corp.'s Portfolio computer and, after building a prototype on it, got feedback that its 8-line, 40-character display was, in fact, too small. Then he turned to the Poqet, which displays 25 80-character lines.

Continued on page 42

Andy Freeberg

Bill Bozym, *Project leader*

Pacific Bell Directory, *San Francisco*

- **Challenge:** To provide an effective yet extremely lightweight computer to sales representatives who are forced to heft numerous paper-filled binders.
- **Technology:** Fujitsu Personal Systems' Poqets, Borland's Paradox database, a proprietary database.
- **Impact:** Full impact yet to be measured, but six months after rollout, 40% of the reps use the technology heavily and 86% say it improves their ability to make sales.

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486, palmtops lead way at PC Expo

Product announcements, Compaq-sparked price cuts highlighted at recent conference

BY MICHAEL FITZGERALD
CW STAFF

NEW YORK — All-hours night life, harrowing taxi rides and hot dogs: It was New York, all right. As if to prove it belonged, PC Expo had more products than you could count. Some of them were even new.

There were also a variety of price cuts made, in response to Compaq Computer Corp.'s low-cost offerings (CW, June 22).

The largest vendor to add its name to the list of price butchers was NEC Technologies, Inc. Boxboro, Mass.-based NEC cut prices on all of its products (see story page 39).

Epson America, Inc. added several new models to its product line. It added a variety of Extended Industry Standard Architecture-based desktop and tower systems based on Intel Corp.'s I486 processor and two XT/AT Bus-based boxes, the Equity 486DX2/50 Plus and the Equity 386/33 Plus. Epson also extended its service hours and added on-site service. A company spokesman said Epson was debating how to price the system in the wake of the Compaq price cuts.

NCR Corp. added a multimedia machine. The product, called the System 3331 Multimedia Learning Station, is the first of a planned series of products that merge technology from AT&T and NCR. It uses either the 25-MHz 486SX or the 33-MHz 486DX, is upgradable and has built-in full-motion video, stereo sound and 1,024- by 768-pixel graphics resolution.

NCR said the product will cost $5,300 when available next month. Neil Whittington, assistant vice president of NCR's multimedia products business unit, said automated teller machines in the future would likely have multimedia capabilities.

Chips and Technologies, Inc. landed some U.S. customers for its 80386 offering. Computerland Corp. will use it in its Trion store brand models, as will Happauge Direct, a division of Happauge Computer Works, Inc. in Happauge, N.Y. Chips and Technologies also showed five palmtop-size personal computers in its booth that use its PC/Chip, including the Handbook from Gateway 2000 Ltd., a 6- by 10-in., 3.6-pound PC that will cost $1,295 and a small pen-based system from JFK Associates, Inc.

First on the block

Wyse Technology, Inc. released what it said was the first 5-pound notebook with a 200M-byte hard drive. The Wyse DecisionMate 486SLKC Model 200/4 uses Cyrix Corp.'s 25-MHz CX486SLC processor, has 4M bytes of random-access memory and will cost $2,899 when it begins shipping later this month.

Memorex Telex Corp. rejoined the ranks of PC manufacturers, announcing nine new systems, the least expensive of which is a 25-MHz 386SX with 2M bytes of RAM for $621.

Phoenix Technologies Ltd. and Calera Recognition Systems, Inc. announced that they would build a combined fax/optical character recognition software product for sale to hardware manufacturers. The integrated product, slated for release by the end of the month, will combine PhoenixFax with Sunnyvale, Calif.-based Calera's FaxGrabber. Phoenix Technologies, based in Norwood, Mass., also said it would create a retail line of communications software.

New York-based Hertz Computer Corp. brought out a 50-MHz 486-based box. The Hertz 486/50E has 8M bytes of RAM, 256K bytes of secondary cache and eight expansion slots. It is priced at $2,149.

Overseas demand

Texas Micro, Inc. said it was shipping its fault-tolerant server, the FSTA, and that its first sales were in the Japanese market. Tokyo's city hall, which is piloting five of the new servers to process its emergency calls, plans to purchase 35 more if the pilot goes as planned.

Dauphin Technology, Inc. announced it would focus 90% of its research and development money on pen computing. Alan Yong, Dauphin's president and chief executive officer, said the company plans to announce five new pen-based systems by the end of the year.

Helix Electronic Publishing Corp., a Haverford, Pa., company, demonstrated a prototype of its CityGuide product. Designed to be used on a portable computer, the CityGuide features Zagat's restaurant guides, landmarks and hotels, plus directions and other information, for the 30 largest U.S. cities. It will cost $69.95 per city when available late this month and requires a system with at least 2M bytes of RAM.

Integrated Technology, Inc., a start-up based in South Orange, N.J., displayed its CompuPhone telephone keyboard, which features a telephone built into a computer keyboard. The product is currently under license to Key Tronic Corp., a large maker of keyboards. The CompuPhone comes in either a headset or handset version.

IN BRIEF

Claris boosts MacDraw Pro

■ **Claris Corp.** has announced MacDraw Pro Version 1.5. The product is reportedly 25% to 75% faster than the previous version and includes full Signaling Apple Computer, Inc. System 7.0 support, including support for QuickTime, Publish & Subscribe and Apple events. It is available for $399.

■ **Cambridge, Mass.-based Dataware Technologies, Inc.** has announced the Kanji version of its compact disc/read-only memory (CD-ROM) authoring and retrieval software. With the addition of this version, users can now develop a single CD-ROM data set with "culturally sensitive" user interfaces in such languages as Japanese, English, French, Italian and others. Data can also be placed on the CD-ROMs in a "parallel" manner that allows multiple languages to be accessed on one CD.

■ **Traveling Software, Inc.** released LapLink Pro Corporate 10-Pak, a licensing deal that will allow users to buy 10 copies of LapLink Pro for $799, less than $80 a user. Individual copies of LapLink retail for $169.95.

■ **IBM** announced recently that it is negotiating with a number of personal computer distributors to resell its memory, hard drives, monitors and adapters. The products are aimed at users of IBM and IBM-compatible PCs.

■ **Zenith Data Systems,** a Groupe Bull subsidiary, said it will offer The Santa Cruz Operation's Open Desktop Release 2.0 as an option with its new Z-Station and Z-Server lines.

The portable that fit in a purse

CONTINUED FROM PAGE 39

Pacific Bell piloted the Poqet, including a proprietary database Bozym built using Microsoft Corp.'s C 6.0, in 1991 and rolled out Poqets to half of its outside representatives — approximately 300 — in January.

The database contains pricing data for advertisements and information on co-op deals. Data is entered in a Borland International, Inc. Paradox format, run through an ASCII transfer program and put on random-access memory cards. Information from the proprietary database on the Poqets is then fed into a personal computer in each sales branch that has a card reader.

Data is ultimately transferred into an Oracle Corp. database on corporate Digital Equipment Corp. VAX systems.

Bozym said 40% of the sales reps who have Poqets use them heavily, and 75% use them at least twice a week. Pacific Bell Directory is evaluating their impact now. Graham said an internal survey showed that 91% of the salespeople said they did their jobs better because of the Poqets.

Graham, now general manager of Pacific Bell Directory's San Jose, Calif., sales branch, said he was going to propose the purchase of more Poqets. Pacific Bell will invest cautiously, though, because it plans to continue looking at new uses of technology, including pen-capable systems. Graham and Bozym said pen technology presents possibilities for the company.

"I went to a construction site with one of our reps to talk to a plumber and we had to climb up to the sixth floor of this building. In an environment like that, two-handed computing would be nice," Bozym said.

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23 Dir./Mgr. Sys. Development, Sys. Architecture
31 Programming Management, Software Developers
41 Engineering, Scientific, R&D, Tech. Mgr.
80 Sys. Integrators/VARs/Consulting Mgr.
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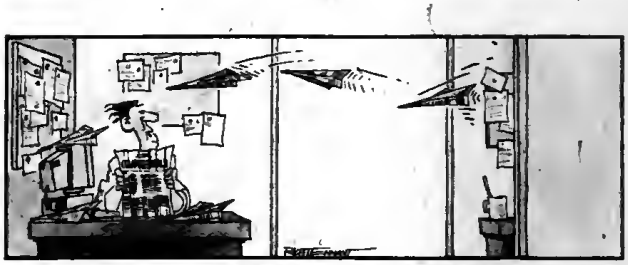

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70 Mining/Construction/Petroleum/Refining/Agric.
80 Manufacturer of Computers Computer-Related Systems or Peripherals
85 System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90 Computer/Peripheral Dealer/Distr./Retailer
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41 Engineering, Scientific, R&D, Tech. Mgr.
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13 Treasurer, Controller, Financial Officer
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51 Sales & Mktg. Management
70 Medical, Legal, Accounting Mgr.
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Caere unveils fax/OCR software

BY CAROL HILDEBRAND
CW STAFF

Caere Corp. is taking optical character recognition (OCR) a step further with the introduction of FaxMaster.

The first example of integrated fax/OCR software aimed at Microsoft Corp.'s Windows, FaxMaster allows users to send and receive both OCR and compressed fax documents.

"Current fax software is a photo, an image — you can't edit it, and you also can't share it" because of the space such an image can take up, noted Larry Miller, Caere's vice president of marketing. "This is the first complete product that sends and receives in computer-readable form."

FaxMaster is based on some of the following features:

• Send and receive. Users can send and receive faxes directly from within a desktop application. The package utilizes direct input technology to allow access between FaxMaster and their applications.

OCR is performed automatically in the background mode for faxes being received.

FaxMaster also enables users to receive both text and image versions of incoming faxes. The software is activated by clicking on the FaxMaster icon within an application.

• OCR. FaxMaster can recognize standard-mode faxes, which are sent at only 200 by 100 dot/in. The technology is built on a neural OCR engine in order to solve the low-resolution fax recognition issue.

• Compress. Proprietary technology from Caere allows users to compress images well beyond industry standards if the user is sending and receiving images. Standard-mode faxes can be compressed by up to 5:1 over CCITT Group III compression, which can significantly reduce storage problems.

Slated for third-quarter availability, FaxMaster is priced at $249. The package requires a personal computer of the 386 class or above with 4M bytes of random-access memory, 8M bytes of available hard drive space and a mouse.

MS-DOS 3.1 or above and Microsoft Windows 3.1 are also necessary.

The software is compatible with Class 1, Class 2, CAS and Sierra SendFax modems.

Windows printing fixes

Part of a series of Windows 3.1 user tips provided by Microsoft Corp. and based on questions commonly asked of Microsoft customer support personnel.

Q What could be causing printing problems that didn't occur in Windows Version 3.0?

A When you set up Windows 3.1, some printer drivers may not get updated correctly. To make sure your printer driver was updated correctly, do the following:

• Remove the printer driver that you are using from your system. Run Control Panel and choose Printers. Select the printer driver and choose the Remove button.

• Use File Manager to change to the WINDOWS/SYSTEM directory. Select the printer driver file name and press the Delete key.

• Reinstall the printer driver by running Control Panel and choosing Printers. Choose the Add button, select your printer and choose the Install button.

Q When I print in landscape mode on a Linotronic printer, the Encapsulated PostScript graphic portions of the document are rotated. Why?

A If you are using the Linotronic or another PostScript printer driver, try adding this line — LandScapeOrient = 270 — to the [ModelName,Port] section of the WINN.INI file. This is the section that says [Linotronic 200/230,LPT1], and not the section that says [PostScript,LPT1].

Q Can I use TrueType fonts with my Hewlett-Packard Co. DeskJet printer?

A The printer drivers supplied by HP do not support TrueType fonts. You can use the DeskJet printer driver that comes with Windows 3.1, but it does not support HP scalable fonts.

Q Is it possible to print in color using my HP DeskJet 500C printer?

A Using the printer driver supplied by HP, you can print in color using this printer. If you want to use TrueType fonts, you can use the printer driver that comes with Windows 3.1; however, you won't be able to print in color.

NEW PRODUCTS

Utilities

Demax Software, Inc. has announced the releases of the System Detective Automated Operations (AO) and Interactive Session modules. Both products assess a range of system elements for more control of the security environment.

They have the ability to monitor remote terminals and lock out users attempting to access systems via batch, network or detached jobs.

System Detective AO has an expanded set of utilities to query its event database. System Detective Interactive Session allows users to interact directly with a suspicious user or process and can be tailored to a company's requirements with a customizable command set.

Pricing for the System Detective AO module starts at $295, and the Interactive Session module starts at $245.

Demax Software
Suite 500
999 Baker Way
San Mateo, Calif. 94404
(415) 341-9017

Peripherals

Nisca, Inc. has started shipping the Niscan Spectra, a 24-bit scanner with software for DOS and Microsoft Corp.'s Windows 3.0 environments.

Images can be incorporated in a variety of business applications including multimedia productions, proposals, newsletters and other documents. Niscan Spectra scans in between 256 or 16 million colors, in 64 or 256 shades of gray and at resolutions from 25 to 400 dot/in. When an image is scanned, it can be edited in either ScanRix and ColoRix VGA or in Picture Publisher, which is software included in the package.

Niscan Spectra for DOS or Windows costs $995.

Nisca
Suite 104
1919 Old Denton Road
Carrollton, Texas 75006
(214) 242-9696

Data Technology Corp. has started shipping the DTC2290 32-bit Integrated Drive Electronics (IDE) to Extended Industry Standard Architecture (EISA) host adapter.

The product is a controller that allows the IDE disk drives to perform at their maximum data rates of up to 8M byte/sec. on the EISA bus.

While under DOS, the DTC2290 typically improves EISA system data throughput by 300% to 400%, according to the company. The DTC2290 can support up to four IDE disk drives, each with an 8G-byte capacity, for a maximum capacity of 32G bytes per card.

EISA configuration file support is provided, and the DTC2290 can support both duplexing and mirroring under Novell, Inc. NetWare with a single card.

The DTC2290 costs $145.

Data Technology
500 Yosemite Drive
Milpitas, Calif. 95035
(408) 942-4000

BusTek Corp. has announced the BT-545S, a Small Computer Systems Interface (SCSI)-2 host adapter that delivers up to 10M byte/sec. synchronous and 7M byte/sec. asynchronous SCSI data transfers.

The adapter is designed for high-speed, I/O-intensive file server and data acquisition environments. Features include an internal edge connector and external 50-pin SCSI-2 connector. Support is provided for hard disk drives with up to 8G bytes of data storage capacity and any combination of up to two 3½-in. or 5¼-in. drives, including support for 2.8M-byte floppy disk drives.

The BT-545S costs $449.

BusTek
4151 Burton Drive
Santa Clara, Calif. 95054
(408) 492-9090

Systems

Panacea, Inc. has announced a line of high-performance AutoCAD software accelerator products for Autodesk, Inc.'s AutoCAD Release 12.

TurboDLD Classic and TurboDLD Deluxe offer four times the increased speed of AutoCAD drivers in Zoom, Pan and Redraw operations. The TurboDLD Classic has "The Big Picture," a movable bird's eye view of the current AutoCAD drawing with the active editing area highlighted. TurboDLD Deluxe comes with real-time panning, a Zoom Preview spyglass, pop-up menus, a drawing viewer and fully reconfigurable digitizer buttons.

The TurboDLD Classic costs $149, and the TurboDLD Deluxe costs $249.

Panacea
Suite 4
Post Office Square
24 Orchard Drive
Londonderry, N.H. 03053
(603) 437-5022

Software application packages

Systat, Inc. has announced Systat for Windows.

According to the company, Microsoft Corp.'s Windows environment makes it easier to learn Systat PC, and the point and click interface speeds tasks, providing quick analyses. Data sets can be analyzed, and a selection of statistical analysis can be accessed and applied to data with QuickStat buttons.

Systat for Windows can be accessed to work in either standard or extended memory modes. This version offers new brushing tools that let users click on data points and examine corresponding cases in the data editor.

Systat for Windows costs $895.

Systat
1800 Sherman Ave.
Evanston, Ill. 60201
(708) 864-5670

Document Techologies, Inc. has created the WDK2000, a Microsoft Corp. Windows developer's kit.

The product was designed to simplify Windows programs for displaying, scanning, processing, printing and storing computer images that have resolution and clarity similar to those printed or written on paper.

The WDK2000 can display images at 200 dot/in. and has imaging functions that are accessed using Dynamic Linked Libraries. More than 40 different high-level functions are offered, including image scan, image print and image storage on local Small Computer Systems Interface or network devices, compression and expansion.

The WDK2000 costs $1,495.

Document Technologies
1300 Charleston Road
Mountain View, Calif.
94043
(415) 964-6100

Data storage

Tandberg Data, Inc. has introduced the Panther 2000, a ¼-in. cartridge tape backup system.

The Panther 2000 features a native storage capacity of 2G bytes, which can be doubled to more than 4G bytes with data compression.

The product is available in internal and external configurations for single-user and local-area network applications and is compatible with a variety of environments, including IBM Personal Computers and compatibles, Sun Microsystems, Inc. SPARCstations and Apple Computer, Inc. Macintoshes.

Panther 2000 prices range from $3,100 to $5,600.

Tandberg Data
Suite 600
2649 Townsgate Road
Westlake Village, Calif.
91361
(805) 495-8384

THE COMPAQ DESKPRO/i. SO A LIMITED PRICE LEADS

The company most qualified to advance the state of the desktop computer announces four systems that represent a breakthrough in R&D. At prices that won't ruin your P&L. Reflecting the level of thinking and quality that you've come to expect from Compaq.

At Compaq, there's a fundamental belief held by all of us that when you set an extraordinary goal, extraordinary people will meet it.

Recently, for example, you made it clear to us that you wanted computers with everything from advanced graphics to audio capability to affordable prices. Our response: the COMPAQ DESKPRO/i Family of PCs. Four new systems loaded with features to enhance productivity.

The built-in COMPAQ QVision 1024 Graphics Controller, for example, allows you to scroll, resize windows and pull down menus up to ten times faster than most popular video graphic subsystems. So quickly, as a matter of fact, you may find your computer waiting for you. Instead of the other way around.

Its unique processor upgrade system ensures your PC won't be swept into obsolescence.

Simple chip upgradability and a 64-KB cache

*This service is provided by contracted Service Providers and may not be available in certain geographic locations. Contact the Compaq Customer Support Center for further details. © 1992 Compaq Computer Corporation. All Rights Reserved. Printed in the U.S.A. COMPAQ DESKPRO Registered U.S. Patent and Trademark Office. QVision and CompaqCare are trademarks of Compaq Computer Corporation.

MUCH FOR THE IDEA THAT TO LIMITED THINKING.

memory module option provide quantum leaps in performance. Without

Intel 386/25, 386/33, 486SX/25, 486/33 ◆ *QVision accelerated graphics* ◆ *Chip upgradability* ◆ *Integroted business oudio* ◆ *4 MB RAM (expandable ta 32 MB)* ◆ *Cache memory standard* ◆ *3 ISA expansion slots* ◆ *3 drive bays* ◆ *84-MB ta 510-MB hord drive options* ◆ *Multi-level security features* ◆ *Microsoft MS-DOS 5.0 as published by Compaq*

similar outlays of cash.

The integrated audio system provides for an unprecedented, yet not unfamiliar dimension in mainstream business computing: your voice.

The result of a working collaboration between Compaq and Microsoft, it allows you, among other things, to easily paste voice messages into spreadsheets and documents. Either as notes to yourself or as voice-mail across your entire network.

And we've engineered this breadth of technology right onto the PC's system board, preserving the small footprint, large storage capacity and expansion of the COMPAQ DESKPRO/i.

Not to mention your financial integrity.

Add CompaqCare, our new service and support program with our free one-year, on-site* limited warranty. An Asset Management Provision that gives you and your network administrator a snapshot of your PC's configuration. And you have nothing short of a system that breaks a lot of new ground. Without breaking the bank.

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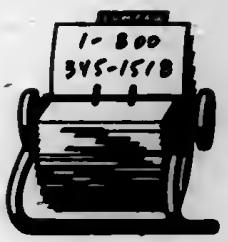

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AICorp

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Transaction cements market dominance of two leading knowledge base system vendors and sets stage for entry into broader application development market

On June 25, 1992, AICorp, Inc. and Aion Corporation, the two leading knowledge base system vendors, signed an agreement to merge operations. The merger establishes a single company with clear market dominance and sets the stage to extend our reach into the larger market for general purpose application development tools.

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Our new company will continue to develop, sell and maintain a broad suite of product solutions, including our two industry-leading knowledge base system products, KBMS® and the Aion® Development System, as well as INTELLECT™, a natural language data access tool. By leveraging our combined technical skills and resources in object orientation, client/server environments, graphical user interfaces, data access and platform portability, we will provide our customers the application development tools and services required to build and sustain productive business applications.

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415-328-9595

Novell envisions stratified market

BY MICHELE DOSTERT
SPECIAL TO CW

Novell, Inc.'s next-generation NetWare 4.0 product, slated to ship by year's end, will be aimed at the high-end, corporatewide network market. The company said it hopes that adding a more robust network operating system product to its current NetWare line will help Novell sell into Fortune 1,000 local-area network sites without loosening its grip on the workgroup and departmental markets.

"NetWare 3.1 was our new, high-end technology when it was introduced, but that was two years ago," said Bob Young, director of marketing at Novell's NetWare Product Division.

"Now, we are positioning NetWare Lite for the 25-user level and our 2.X line at the workgroup, 100-user versions that represent a major push for us to get into the high end of the market," Young said.

Little user interest

Earlier, Novell had planned to call its forthcoming NetWare release NetWare 3.2 and position it as an extension of its 3.X line. However, Novell said it discovered that many 3.1 customers were not interested in the planned enhancements, such as directory and naming services, foreign language support, integrated image processing engine and SFT III fault tolerance.

Also, Novell's experimental alpha release of a 3.11-based 1,000-user version of NetWare reportedly ran into problems with 3.X's 256-user limit dictated by its bindery structure.

"I looked at bringing in the 3.X-based 1,000-user NetWare but decided against it," said Brian Gunnell, assistant vice president of networks at Canseco, Inc., a Carmel, Ind.-based insurance holding company with a 600-node NetWare LAN. "The printing didn't work. We wanted to use it for mail, but it was limited by the 256-user bindery — there were just too many caveats for me."

"We built our 1,000-user version on NetWare 3.X, but we always intended to move it to a directory-based platform. It was our customers who suggested that such a major rearchitecture dictated a next-generation product name; hence, NetWare 4.0," Young said.

Some industry experts said they expect NetWare 4.0 to do well in the Fortune 1,000 market. "I talked to two customers today who are very interested in 1,000-user NetWare 4.0, and both want to use it as glue to help integrate their mainframe and minis with their LANs," said Pete Heles, vice president of LanTech, a high-end integrator in Indianapolis.

"Our customers with large LANs are very excited about the new directory-based NetWare," said Barry Saltzman, head of JWP, Inc.'s systems consulting group in New York. "I think most of them will upgrade because the new directory services will let them manage their distributed LANs in all their branches from one central location, which is crucial for them."

Novell will try to lure large 3.X users to 4.0 by making the upgrade path as painless as possible: A "bindery emulator" in 4.0 will allow seamless integration of 3.X and 4.0 servers into one transparent network.

Slow to switch

But many 3.X users are approaching the upgrade cautiously. "We will look at 4.0 when it comes out; but I'm always leery of .0 releases," Gunnell said. "I'll definitely bring it up in test mode and run some benchmarks on it before I think about putting it into production."

Many users just getting comfortable with NetWare 3.11 said they are not inclined to upgrade anytime soon. "Sure, the improved directory and naming structure would be nice, but it's not enough to get me to move," said Bob Wrage, a network administrator at Deere & Co. in Moline, Ill. "Really, we're still getting our feet wet with 3.11. Now, if 4.0 would let me run my applications in protected mode, that would make me move."

Although Novell has not confirmed it, high-end resellers and applications developers who have seen preliminary demonstrations of 4.0 indicate that it will enable users to run in protected mode.

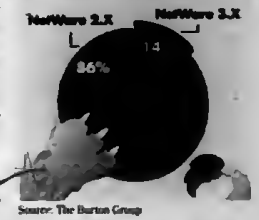
Barry Gilbert, director of the market research firm InfoCorp in Acton, Mass., said, "NetWare 4.0 won't be released till the end of the year, so we won't know until probably the first quarter of '93 how many users will move to 4.0, and how fast. It's going to be interesting to see how many customers really want 1,000-user NetWare."

Dostert is a Salt Lake City-based freelance writer.

Lion's share

The lower end NetWare 2.0 line dominates the Novell installed base, although Novell sees room for a NetWare version aimed higher than NetWare 3.0

Percent of installed base
Total: 1.3 million servers
(year-end 1991)



Source: The Burton Group

PeopleSoft offers electronic support

BY ROSEMARY HAMILTON
CW STAFF

Two users of PeopleSoft, Inc.'s recently released electronic customer support system said it is a big step up from the traditional service methods.

PeopleSoft's PS/Forum is based on Lotus Development Corp.'s Notes workgroup software. The human resources software company purchased 250 copies of Notes from Lotus and is providing them to customers as part of their standard maintenance deal. With Notes, customers can access three databases at PeopleSoft, including one that contains updates and fixes for the software.

"As far as providing access, there's no substitute," said Dick Schell, director of information systems at The Turner Corp. in New York. "There's no waiting for phone calls. We can just contact them any time we want to."

Customers can also access a database that serves as a user forum or bulletin board for PeopleSoft users to exchange information. Another database is for general discussion purposes.

At your service

Schell said PS/Forum allows him to directly correspond to PeopleSoft and, if an issue requires more in-depth discussion, a meeting can be arranged. At the same time, if a product concern is minor, a user can find information in one of the databases and not have to wait for a company response.

"There's more efficient communication," added David Weizer, manager of human resources systems and records at Rolm, a Siemens company. "You can type out a lengthy message [to PeopleSoft support], and it allows them to know in detail what it is you need to know. Then they have time to formulate their response."

PeopleSoft uses Notes internally and has been planning to extend it to its customer base.

$42 015 769 242

By the end of this week Computerworld readers will have spent over **$42 Billion** on Information Technology this year – representing nearly half of all IT spending to date in 1992.

COMPUTERWORLD

Work flow emerges as imaging trend

Importance soars as imaging technology evolves into catalyst for business process re-engineering

BY ELLIS BOOKER
CW STAFF

ANAHEIM, Calif. — Work flow was highlighted as the crucial software component of imaging systems during last month's Association for Image and Information Management (AIIM) conference here.

On the hardware side, meanwhile, there was a plethora of personal computer local-area network-based imaging systems. There was also a gathering of support for Unix-based servers in general — particularly the IBM RISC System/6000.

Why has work flow, which manages the routing of images between individuals, applications and processes, become such an important software category?

As imaging has evolved from a mundane "storage and retrieval" technology to a leading catalyst for business process re-engineering, work flow has become the apparatus for this broader activity.

On the brink

Indeed, re-engineering was on the minds of many attendees, according to a straw poll conducted by IBM at the show. Among other results, the survey found that 76% of the 377 respondents are implementing or plan to implement a business re-engineering project; approximately 70% said this activity was "likely" to take place within a year.

Virtually all imaging vendors now offer work flow, either of their own design or based on another vendor's core technology.

For instance, Digital Equipment Corp. picked EPIC/workflow from Computron Technologies Corp. in Rutherford, N.J., as a work-flow component for its VAX/VMS DECimage Express product.

The industry trend, apparent at AIIM, is for the work-flow component, like the image system, to run under an icon-driven graphical user interface (GUI). For the majority of vendors, this means Microsoft Corp.'s Windows environment.

In addition, the capabilities of work-flow systems continue to improve. Sigma Systems, Inc., for instance, announced at AIIM a new version of its RouteBuilder graphical work-flow development product that supports parallel routing, time and event queues and the creation of ad hoc work-flow instructions.

Indeed, while work-flow systems are still primarily targeted at information systems departments or systems integrators, the move toward object-oriented graphical interfaces promises to make them easy enough for end users to program.

In its AIIM booth, for instance, IBM demonstrated a prototype object-oriented system that builds host-based work-flow instructions from an OS/2 2.0 workstation.

Giant leap

Show attendees said ease of use and end-user access to imaging could take a quantum step forward when Lotus Development Corp.'s Notes: Document Imaging, a $200 to $400 companion product to Lotus' Notes, hits the streets within the next two months.

Built under a partnership between Lotus and Eastman Kodak Co., Calera Recognition Systems, Inc. and GammaLink, the product could have a profound effect on the imaging industry, according to analysts.

"The total world of imaging is 50,000 to 60,000 seats, so if the image version of Notes gets 10% of, say, a half-million Notes sites, it'll double the size of the industry," said analyst Bruce R. Silver at BIS Strategic Decisions in Norwell, Mass.

"But Notes isn't going to do claims processing at Blue Shield," warned Silver, adding that transaction-intensive, production-oriented imaging products from vendors such as FileNet Corp. would still find a large audience.

Noting the impact that work flow could have on their business operations, several sophisticated users of imaging technology at AIIM indicated a need to "decouple" the work-flow system from the imaging system.

"The work flow we want is one that works independently of the imaging system," said Gamil Sakla, assistant vice president at The First National Bank of Chicago.

No easy task

"Architecturally it's there, it's possible, but it's not simple," Silver observed, adding that this might be one direction for the marketplace in the coming year.

But if work-flow systems do become interoperable, imaging systems from different vendors will be able to work together transparently.

That scenario suggests partnerships between vendors offering high-end, transaction-oriented imaging solutions — the kinds of products designed to automate insurance claims processing — and single-user or workgroup imaging systems that typically support more ad hoc, white-collar applications.

Products issuing from these relationships could span departmental and production-oriented applications.

"The first vendor to provide that," said Jordan M. Libit, vice president of marketing at FileNet, "is likely to have a winner."

IN BRIEF

Xerox joins Intergraph

■ Intergraph Corp. and Xerox Imaging Systems (XIS) recently formed a business alliance to provide Intergraph customers with text recognition software. Under the agreement, Intergraph will integrate XIS' ScanWorx, a document input system for Unix platforms, into its reduced instruction set computing-based workstation line for document image management and publishing systems.

One major customer of the combined Intergraph/XIS product is the U.S. Naval Sea Systems Command, which last year awarded Intergraph a $362 million contract for computer-aided design work.

Citicorp Credit draws ledger into Sun net

BY JOHANNA AMBROSIO
CW STAFF

Citicorp Credit Services' financial reporting group is adding to the suite of commercial applications on its network of Sun Microsystems, Inc. workstations. Most recently, the Citicorp subsidiary chose a general ledger package.

This package joins software from Lotus Development Corp. and Island Graphics Corp., among others, that runs on Citicorp Credit's 50-workstation Sun network. The Long Island City, N.Y.-based company uses SPARC-1 and SPARC-2 workstations, three Sun servers and 20 personal computers, including Compaq Computer Corp. and Dell Computer Corp. machines.

The general ledger system, called RFS/GL from Skylight Systems in Wyncote, Pa., will initially be used to track Citicorp Credit's asset securitization, which involves turning $23 billion worth of credit-card receivables into secured bonds.

"Eventually we will use RFS/GL as a subledger with the corporate Citicorp general ledger system," said John Weisenseel, vice president of treasury operations at Citicorp Credit. The corporate general ledger is a package from McCormack & Dodge, now part of Dun & Bradstreet Software, that runs on an IBM mainframe.

> THE GENERAL ledger system will initially be used to track Citicorp Credit's asset securitization.

Citicorp Credit is also writing other applications, including a cash management system, with which the Skylight software will communicate. The general ledger will be operational by late this month, Weisenseel said, and will support up to four users.

The Skylight software is replacing a PC package called Solomon. "We found the current package to be inflexible," said Tom Adamski, director of card products treasury systems. "RFS/GL had the best grip on multicurrency," an important requirement because Citicorp does business in so many different countries, Adamski said.

Another criterion was that the package had to work with Sybase, Inc.'s relational database under Unix, since that is Citicorp Credit's standard. Not quite three years ago, Citicorp Credit switched over from a proprietary Hewlett-Packard Co. Series 3000 minicomputer to the Sun workstations. "We wanted the price/performance and scalability of the client/server architecture," Adamski said. "And development is much easier on the Suns than it was on either a mainframe or a minicomputer."

NEW PRODUCTS

LAN hardware

Asante Technologies, Inc. has introduced a series of Token Ring adapter cards.

TokenPac cards are designed for personal computers and compatibles based on National Semiconductor Corp.'s Token Ring Protocol Interface Controller. The cards connect PCs based on Extended Industry Standard Architecture and IBM's Micro Channel Architecture to IEEE 802.5 Token Ring networks and provide 4/16M bit/sec. performance.

The TokenPac network interface cards cost $699.

Asante Technologies
404 Tasman Drive
Sunnyvale, Calif. 94089
(408) 752-8388

Workgroup software applications

Applied System Technologies, Inc. has announced the Manager's Window, a Microsoft Corp. Windows-based management module for Dispatch-1 and Fieldwatch, the company's service management systems.

It incorporates three integrated windows that offer functional and graphical capabilities. The Dispatch Board View displays a matrix of call assignments in priority order. The Call/Work Order View opens call boxes and reveals data about the service call, and Map View visually depicts geographic hot spots, work force allocations and current technician statuses.

The Manager's Window costs $7,995.

AST
100 Highpoint Drive
Chalfont, Pa. 18914
(215) 822-8888

Electronic mail

Reach Software Corp. has introduced a second-generation version of Mailman, an open electronic-mail platform.

Mailman 2.0 is a Microsoft Corp. Windows-based open E-mail product that has access to a variety of E-mail servers, databases and applications. New features include an improved user interface for message functions, fast message composing and direct access to local-area network directories. Mailman 2.0 supports Novell, Inc.'s NetWare MHS, Banyan Systems, Inc.'s Vines Mail and Windows 3.1.

Mailman 2.0 for MHS costs $995 for 25 users and $2,295 for unlimited users per mail server. Mailman 2.0 for Vines costs $1,495 for unlimited users per mail server.

Reach Software
872 Hermosa Drive
Sunnyvale, Calif. 94086
(408) 733-8685

DOD funds three-year study on LAN/WAN ATM link coordination

BY ELISABETH HORWITT
CW STAFF

A consortium of vendor, academic and government organizations recently embarked on a three-year test of asynchronous transfer mode (ATM) technology under heavy application loads. A major focus of the Multidimensional Applications and Gigabit Internetwork Consortium is to study how to effectively coordinate links between local- and wide-area ATM devices, consortium members said.

Funded by the U.S. Department of Defense (DOD), the project will run a bandwidth-hungry dynamic terrain visualization application across an ATM-based network. The application will use the ATM network to provide several geographically separate data centers with terrain visualization data collected by the Earth Resources Observation Systems Data Center, a Sioux Falls, S.D.-based unit of the U.S. Geological Survey's National Mapping Division.

The data will end up at the Army's Future Battle Laboratory in Fort Leavenworth, Kan., where military personnel will be able to view terrain on a computer screen as if they were traveling over it by foot, air or car.

Also linked via the ATM network will be the Minnesota Super Computer Center, Inc. in Minneapolis and the University of Kansas in Lawrence, Kan. U.S. Sprint Communications Co. will interconnect the various sites over 2.4G bit/sec. ATM links that are based on the Synchronous Optical Network (Sonet) standard, spokesmen said.

All-purpose project

The project was designed to serve several purposes for the consortium members. Of major potential use to future ATM network users is the work being done by Digital Equipment Corp., Sprint, Northern Telecom, Inc. and the University of Kansas to "explore the feasibility of some options for interfacing the LAN and WAN ATM," said Gary Minden, an associate professor of electrical and computer engineering at the University of Kansas. Among the issues to be explored during the project are the following:

- What protocols the ATM local-area network switch should use to set up circuits over a long-distance ATM network. "The local ATM group is talking about setting up the initial circuits via a Simple Network Management Protocol mechanism, but that probably won't fly on the WAN," Minden said.
- How to manage allocation of long-distance ATM bandwidth among different devices to avoid congestion.
- How serious is the risk that occasional cells, or small packets, will be dropped during transmission, and how this risk can be minimized.

MILITARY PERSONNEL will be able to view terrain on a computer screen as if they were actually traveling over it by foot, air or car.

In general, the vendors will be testing interoperability and performance of ATM links that include both a LAN and WAN network component. The university will be testing a gateway that it is developing between ATM-based LANs and WAN services, he added. An experimental ATM LAN switch from DEC will be using the gateway to gain access to Sprint's ATM-based long-distance connections, Minden said.

DOD expects to test a potentially useful application for the military and also collect some valuable data about high-speed networks that will be useful to government high-speed network projects such as the National Research and Education Network.

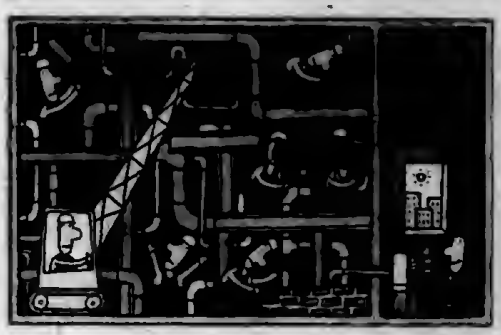
"This is one of several gigabit-per-second, test-bed networks that DARPA is working on," a Sprint spokesman said.

Sprint hopes to gain insight into troubleshooting, management and interoperability issues associated with operating a high-speed network, the spokesman added. Sprint also plans to introduce a service based on broadband Integrated Services Digital Network, which will incorporate both ATM and Sonet, in the mid-1990s, he added.

Hiding migration from users

X is one aid for firms in systems transition

BY JOANIE M. WEXLER
CW STAFF



Many information services professionals migrating their companies from host-centric to distributed computing schemes are facing a juggling act as they maintain large legacy systems while porting corporate applications to smaller, dispersed platforms.

This challenge is generally being met by creating desktop "windows" into the corporate network through either home-grown or industry-standard interfaces such as the X Window System.

Both tacks mask users from the application porting that is going on behind the scenes.

Users, then, transparently access data from wherever it happens to reside at the moment across the network without necessarily knowing where they are getting it from.

Protection preparation

The approach is an example of one migration method advocated by Judith Hurwitz, president of Hurwitz Consulting Group in Newton, Mass. That strategy consists of "surrounding" applications while they are ported to new platforms. While heavy-duty application re-engineering takes place on the back-end computer engines, users continue to see a consistent interface, and the desktop hardware investment is protected, Hurwitz explained.

For example, companies such as Enron Gas Services Corp. in Houston and Citicorp's Global Cash Management Services Group in Tampa, Fla., are building separate front ends for each of the various desktop platforms installed throughout their organizations. This scenario can require multiple communications protocol stacks on each desktop in order to allow the user to tap into the various disparate hosts, explained Jim Queen, local-area network manager at Enron.

"Users get a screenful of data that could easily be a composite from several different platforms" across the network, Queen said. Enron is using Powersoft Corp.'s PowerBuilder, an SQL development tool, to develop a Microsoft Corp. Windows application for accessing far-flung data.

On other desktops, the company is running an OS/2 application with Novell, Inc. NetWare Requester, IBM Systems Network Architecture and Unix-oriented Transmission Control

Continued on page 52

Re-engineering report cards

To help bring their software re-engineering projects in on time and within budget, some organizations have looked to the Software Process Program at the Software Engineering Institute (SEI) at Carnegie Mellon University in Pittsburgh.

The program is a review process that helps organizations evaluate and implement project planning, testing, standards implementation, configuration management and quality assurance procedures in their software development efforts. One commercial site leveraging the program is Citicorp, which began the process last summer. As part of its global effort to slash network and systems redundancies throughout the corporation, Citicorp is turning to open, distributed computing based on the Open Software Foundation's Distributed Computing Environment, explained Richard Lessard, senior vice president of applications development in the Global Cash Management Services division.

For its software development efforts, which include shifting applications from a mainframe-centric to distributed scenario, Citicorp received a "strong 2" from Carnegie Mellon on a 1-to-5 scale, with 5 reflecting the most mature development category, Lessard said.

Bill Curtis, director of the Carnegie Mellon program, explained that 80% of the 59 organizations assessed so far have received a 1 rating, which indicates an organization with "really no defined process that is crisis-driven and has lots of defects." Only 2% to 3% received a 4; no organizations received a 5. Carnegie Mellon is planning to issue a report on its findings with the 59 companies later this year, Curtis said.

"Organizations moving to distributed computing are finding that they don't have a life-cycle process in place, such as version control," noted Paul Scheib, senior managing consultant at Arthur D. Little, Inc. in Burlington, Mass. His firm is one of nine independent consulting firms licensed by Carnegie Mellon to conduct the process evaluations. "A lot of the controls of the mainframe environment just go away when you distribute," he added.

Lessard said the study told Citicorp that in order to advance to a 3 rating, it must either buy or build LAN-based tools that allow the firm to integrate the modeling and estimating efforts of similar, individual projects and build in appropriate chargeback and better "what if" mechanisms.

Users have cited a lack of tools as a major hurdle in moving to distributed computing. However, Lessard noted, "tools are secondary. If you can't manage the development process" from an organizational perspective, "there is no point."

JOANIE M. WEXLER

Router delivery lag concerns users

BY JOANIE M. WEXLER
CW STAFF

Despite user excitement about plans by the two fastest-growing multiprotocol router vendors to build industry-standard switches for multimedia applications [CW, June 29], several companies pointed to some housekeeping issues they would like to see their suppliers clear up first.

For example, delivery of Wellfleet Communications, Inc.'s gigabit-backplane Backbone Node bridge/router — with versions originally slated to ship during the first and second quarters of this year — has slipped by about a quarter. While shipment is "imminent," according to Wellfleet President Paul Severino, the lower-end Link Backbone Node, due to ship first, will route only Digital Equipment Corp. DECnet Phase IV and Transmission Control Protocol/Internet Protocol (IP) alongside translation and transparent bridging.

Wellfleet is not violating any promises with the limited support, but noting just the two protocols "doesn't do it for us because [Novell, Inc.'s] IPX is one of our biggest protocols," said Vincent G. Curatolo, vice president of distributed systems services at Wellfleet shop Merrill Lynch & Co. in New York.

Similarly, "We're waiting for the [highest end] Backbone Concentrator Node for its redundancy level here at the data center," said John Scoggin, supervisor of network operations at Delmarva Power & Light Co., a Wellfleet customer in Newark, Del. On the protocol support side, Delmarva is tapping its foot for Wellfleet's promised Banyan Systems, Inc. Vines IP support, Scoggin said.

Wellfleet shop Bear, Stearns & Co. has been "after Wellfleet since the beginning of the year to develop an HSSI," or High-Speed Serial Interface, said Ken Starkey, associate director of communications at the New York-based firm. He said that in the interim, he has installed a few routers from rival Cisco Systems, Inc. to support HSSI for some specific applications.

However, the industry also has issues with Cisco about the life cycle of its C bus-based hardware architecture, which relies on shared memory and CPU power that render it less scalable as networks grow.

"The fault tolerance we need, particularly when we add our IBM SNA traffic to our router network, can't be found anywhere today except at Wellfleet," said Anthony Brown, manager of communications product development at Martin Marietta Information Systems Co. in Orlando, Fla. Martin Marietta is currently preparing to issue a router bid.

The ability to isolate failures to protect network segments is inherent in Wellfleet's forthcoming Backbone Node design, which dedicates CPU power and memory to each set of network interface cards rather than having multiple router elements contend for those resources.

"Redundant CPU and hot swapability [being able to add or remove interface cards without bringing down the network] will be architecturally difficult for Cisco. They'll probably need to build a new box to do it," Brown predicted.

Cisco President John P. Morgridge said his firm "is always looking at changing architectures" but must be careful not to displace its installed base. He acknowledged that it would be "highly unlikely" that a new hardware architecture based on a different bus would be compatible with existing Cisco equipment.

Morgridge said Cisco recognizes the importance to customers of hot swapability, but he declined to say when the firm might provide that capability.

Hot tech

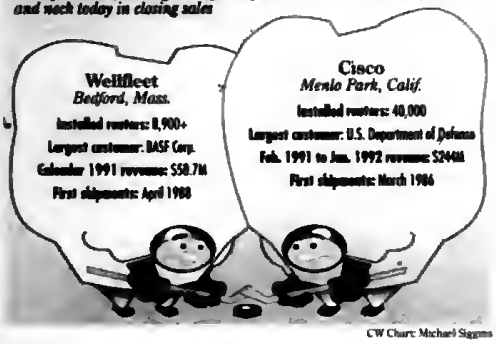
This issue is important to large Cisco shop Young & Rubicam, Inc., based in New York. "I haven't had any trouble with Cisco, but this issue makes me nervous because of our heavy reliance on these nodes," said Howard Maynard, senior vice president and director of MIS.

Frank Dzubeck, president of Communications Network Architects, Inc., a Washington, D.C., consultancy, insisted, "Cisco has got to come out with an interim architecture between what it currently has and its [Asynchronous Transfer Mode] switch, or Wellfleet will gain all the market share at the high end."

Rick Malone, a principal at Vertical Systems Group, a consulting firm in Dedham, Mass., agreed. "In the next generation, Cisco must be concerned with their hardware platform. If you run out of capacity, there's not much that interface software can do," he said.

Router rival face-off

Cisco's two-year jump on Wellfleet has rendered its presence significantly more pervasive, although analysts say the two firms are running neck and neck today in closing sales



CW Chart: Michael Siggins

Protocol may save IBM's 6611 processor

BY JOANIE M. WEXLER
CW STAFF

Ironically, it may be the open systems movement that saves IBM's neck in the multiprotocol router market.

Analysts point out that the proliferation of the industry-standard Open Shortest Path First (OSPF) routing protocol could reserve some space for IBM's 6611 Network Processor in existing internetworks.

IBM recently announced it will ship the 6611 three months late to ensure effective integration of myriad routing, bridging and management functions rather than shipping a product that might not meet user expectations [CW, June 29].

OSPF is a standard way for routers in Transmission Control Protocol/Internet Protocol networks to communicate routing table information, thus allowing routers from different vendors supporting the protocol to work together in one network. To date, organizations have tended to stick with one router vendor because of interoperability concerns.

With router leaders such as Cisco Systems, Inc. and Wellfleet Communications, Inc. growing at competitively rapid rates and stockpiling market share, the interoperability afforded by OSPF could allow users to wait to install IBM routers in network niches where they deem it strategic, while moving ahead now with their base internetworking strategies.

"If OSPF proves to be a satisfactory mechanism for creating multivendor router networks, IBM will hold its own in the router market," predicted Frank Dzubeck, president of Communications Network Architects, Inc., a Washington, D.C., consultancy.

Forum formed

To that end, a group of router vendors, including Wellfleet, Proteon, Inc. and 3Com Corp., recently formed the OSPF Interoperability Forum to ensure that their routers mesh smoothly across networks.

"When OSPF kicks in, it will give us some alternatives," said Howard Maynard, senior vice president and director of MIS at worldwide advertising agency Young & Rubicam, Inc., a large Cisco shop based in New York. "But right now, a mixed bag [of routers] would only make my life more complicated."

While most users said they want the security of vendor independence, many may nonetheless elect not to exercise their options unless there are specific segments of their networks that merit a deviation from the corporate standard either by function or cost.

"Ideally, we'd like to standardize on one vendor and simply avoid dealing with the OSPF issues," said the vice president of telecommunications at a global bank who preferred not to be named.

IN BRIEF

TX3 hub enhanced

■ **Ascom Timeplex** announced that it has enhanced its TX3/Super-Hub System to support additional high-speed capabilities. The hub's Multimegabit Data Transport Capability is said to support High-Speed Serial Interface, V.35 and RS-530 connections at rates of 1.54M to 41M bit/sec. The hub can also dynamically set up multiple T1 channels that can be bundled into a single high-speed link. The enhancements are scheduled for October availability at prices of $7,200 to $12,000.

■ **BT Tymnet, Inc.** has signed two major video-conferencing customers. Unilever, a $40 billion international consumer goods company, has decided to standardize on BT's technology and products for inter- and intracompany video communications. Unilever firm Lever Brothers Co. plans to use BT's service and equipment at its headquarters in London; Rotterdam, Netherlands; and in several U.S. locations.

In addition, the Michigan Collegiate Telecommunications Association, a consortium of 50 colleges and universities, has selected BT's video-conferencing systems as the basis for interactive, video-based courses.

Hiding migration woes

CONTINUED FROM PAGE 51

Protocol/Internet Protocol stacks for accessing different host environments, he said.

Similarly, Richard Lessard, Citicorp Global Cash Management Services senior vice president of applications development, explained that his firm is using a homegrown front-end mask while "we go into the tough back end and build, say, one investment system for everyone."

However, other large companies such as Kash n' Karry Food Stores and The World Bank are achieving the same effect by using X display terminals, which support industry-standard graphical user interfaces, and the networkwide use of the X protocol.

X terminals are graphics-oriented hardware/software devices that allow users to pull up multiple application windows on their screen from disparate networked hosts. Rather than running applications on the desktop that might have to change, they open up desktop windows to the applications instead, explained Dennis W. Read, information engineer at Kash n' Karry.

Use of X terminals also eliminates the need to run multiple protocol stacks on the desktop, observers said.

"In our organization, any technology we use must be scalable so we can incrementally add users with the right granularity," said Larry Austin, senior systems specialist at The World Bank in Washington, D.C. "The beauty of X is that we can scale by just adding another server."

Open or closed? You decide

Users split on picking proprietary or independent relational databases

ANALYSIS

BY JEAN S. BOZMAN
CW STAFF

Picking a relational database is a weighty decision. Features, functions, performance and price all go into the selection process. But users still seem divided over whether to buy a database from their systems vendor or one from an independent supplier that runs on many hardware platforms.

Relational database management system software sales are split between proprietary and independent databases, according to surveys conducted by International Data Corp. (IDC) in Framingham, Mass. Independent RDBMS sales in 1991 totaled $1.9 billion in the U.S. Roughly $1.6 billion in U.S. sales that year were by systems vendors such as IBM, Digital Equipment Corp. and Hewlett-Packard Co., said Tony Picardi, director of software research at IDC.

The trade-offs between choosing "open" or "closed" systems are many, users said. Some said proprietary systems can be tuned better to their HP, DEC or IBM machines, providing better performance. But others said it is more important to have database products and tools that can be moved to other hardware platforms, providing more flexibility in future information systems planning.

Kenny Services, Inc., a New York division of Standard & Poor'a Corp., is migrating from DEC VAXs to faster Sequent Computer Corp. Model 750s by moving its Oracle Corp. RDBMS to new hardware. "We didn't feel it was cost-effective to run Oracle on the VAXs anymore," said Ira Kirschner, director of technical services at Kenny Services. "Our incremental growth required us to do box swaps to get more power, and each box swap cost about $200,000."

But longtime DEC and HP computer users, who feel no need to mix and match computer systems, said they benefit by getting database and systems support from the same vendor. And all major RDBMS vendors offer similar features for distributed database applications. "The classic trade-off is between flexibility and power," said Neal Hill, a senior analyst at Forrester Research, Inc. in Cambridge, Mass. "The systems vendor can tune the database to the operating system, and they can devote more of the code in the database to optimizing performance for their platform."

"There are still some performance advantages to using a systems vendor's database," said Richard Kislowski, vice president and chief information officer at PacifiCare Health Systems, Inc., a health maintenance organization in Cypress, Calif. "Five years ago, it made lots of difference compared to the performance of an independent database. Today, the difference is in the 10% to 30% range."

Kislowski, who uses Rdb 4.0 on a DEC VAX 9000 Model 400 as his primary production machine, sees another advantage: synchronization of releases. When PacifiCare upgrades to DEC's VMS 5.5 later this month, it will know that Rdb was changed to take advantage of the new VMS features. "When you're dealing with open software, the database might be ported to an HP platform first, rather than to DEC," he said.

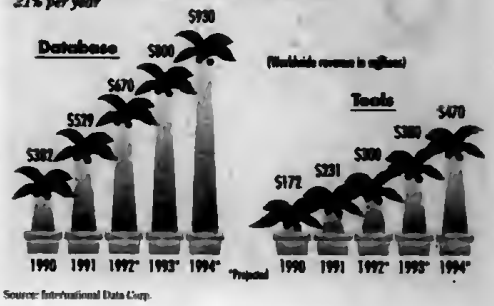
Both DEC and HP give users powerful financial incentives to stay with their proprietary Rdb and AllBase/SQL databases, respectively. A runtime version of Rdb has been provided at no cost for several years — and HP offers its AllBase at a steep discount compared with open systems RDBMS products.

Support for a wide range of platforms sometimes strains independent vendors' resources,

Continued on page 57

Open and growing

Growth in the Unix DBMS market is averaging 21% per year



Source: International Data Corp.

WHEN USERS OF independent RDBMS packages do choose open platforms over proprietary systems, cost savings from cheaper hardware is often cited as the rationale.

DB2 tool aids remote databases

BY THOMAS HOFFMAN
CW STAFF

HOUSTON — Database users know that installing IBM DB2 on all machines that need to access DB2 data can get pretty expensive, with DB2 licenses costing more than $3,000 per month. However, DB2 users may find solace in a new software tool aimed at allowing DB2 applications to exist where DB2 machines do not.

The new product, Shadow for DB2, which was introduced last month by Neon Systems, Inc., eases remote use of DB2 databases while reducing the need to replicate data. Peter Schaeffer, director of technology at Neon, said Shadow for DB2 replicates data running on DB2 machines operating under IBM's MVS/XA or later releases of MVS.

Schaeffer said IBM has a system called Distributed Data Facility (DDF) that allows DB2 systems to communicate with one another. However, DDF requires users to conduct a number of administrative actions to request information from remote locations, according to Schaeffer.

Zero effort

For example, with DDF, DB2 users must change programs in order to access remote data. No such requirements apply to Shadow for DB2, which has pleased at least one early user.

"The administrative effort of Shadow for DB2 vs. DDF is zippo," said Robert Iappini, a senior consulting engineer at Texaco, Inc., which has been testing Shadow for DB2 for six weeks for its Time-Sharing Option applications.

Texaco is testing Shadow for DB2 at two data centers in Tulsa, Okla., and Iappini said he is pleased with the results thus far. He cited resource savings and reduced overhead because Texaco no longer needs to replicate data for each of its DB2 machines. Iappini said his company will eventually install the software tool in Texaco's Bellaire, Texas, data center so all three data centers can be linked.

Schaeffer said his company is developing a mechanism for Sybase, Inc.'s SQL Server applications to access DB2, with plans to begin shipping a product within two months. Schaeffer said a similar product, called Shadow for IMS, would comprise personal computer or workstation-to-mainframe connectivity. He said Shadow for IMS will start shipping by September.

Shadow for DB2 is priced from $9,950 to $55,000, depending on the user's hardware platform, with multiple copy discounts available.

BIM Spotlight

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DEC moves cause rumbles in third-party storage market

BY MELINDA-CAROL BALLOU
CW STAFF

Digital Equipment Corp.'s aggressive stance in the third-party DEC storage market is causing some concern among users at VAX sites about whether they will continue to have access to a range of competitive options.

Meanwhile, the recent sale of Costa Mesa, Calif.-based Emulex Corp.'s DEC storage line of products to System Industries, Inc. led users to question whether Emulex's shift in focus may become a wider trend.

DEC's lawsuits over its Standard Disk Interconnect (SDI) and Standard Tape Interconnect (STI) patents, together with a shrinking market, combined to influence Emulex's decision [CW, June 29].

"DEC is making it difficult for companies to survive. Look at Emulex," said Kent Gardner, director of the computational laboratory at Crump Institute for Biological Imaging at the University of California, Los Angeles. "DEC has a certain right of return on its investment. But the third-party market made DEC what it is because people were able to put their [DEC] systems together inexpensively [via third-party products]. DEC doesn't have a right to force them out of business."

Users singled out DEC's lawsuits as particularly worrisome. They favor a licensing strategy like the one DEC is now offering for the company's Digital Storage System Interconnect (DSSI) technology. Industry analysts and some third-party vendors said that policy is not prohibitive in its pricing structures.

According to some analysts, DEC was to some extent driven into offering this licensing program by pressure from large DEC sites with third-party DSSI products and with whom DEC did not desire to jeopardize business.

A number of third-party vendors, including System Industries and Emulex, signed letters of accord with DEC to phase out sales of their SDI/STI products.

Vendors who continue to have lawsuits pending include MicroTechnologies, Inc. (MTI) in Anaheim, Calif., and Lago Systems, Inc. in Los Gatos, Calif.

"DEC is using the patents for marketing purposes and is trying to restrain trade," said Larry Pyle, president of Lago.

DEC officials said, however, they are merely defending the company's rights. "Patents allow innovators the right to exclude others from making, using or selling the patented device," said John Gunther, DEC's legal counsel for mass storage. "In the case of the SDI and STI technology, we are merely asking for those rights guaranteed us by the U.S. Constitution."

On the other hand, users emphasized the importance of third-party alternatives. "It is a bit of a concern — I would hate to have DEC be my only option," Gardner said. "A smaller company can bring newer technology out sooner and at a lower cost."

Tom Stewart, VAX systems manager at Information Handling Services, an information company in Englewood, Colo., recently purchased a FailSafe redundant arrays of inexpensive disks (RAID) box from MTI.

"Until recently, we always purchased from DEC," Stewart said. "We used VAX striping to get performance, but we really needed to look at some other alternatives. DEC is working on RAID technology, but we needed a product that was ready. Obviously, if you can only buy from one vendor, there also are not many choices on what you are going to pay."

IN BRIEF

Navy gets hardware

■ **Cable & Computer Technology, Inc.**, an Anaheim, Calif.-based contractor, last month became the first of three prime contractors in the U.S. Navy's proof of concept development program, dubbed Next Generation Computer Resources (NGCR), to deliver fully compliant Futurebus+ hardware. Other contractors include **Raytheon Corp.**'s Marlboro, Mass.-based Equipment Division, which seeks to complete acceptance testing of its NGCR systems before the end of the summer, Cable & Computer Technology officials said. The third contractor, **Litton Data Systems, Inc.** in Pascagoula, Miss., is still listed as part of NCGR development, but the status of its work is unclear, Cable & Computer Technology officials said.

■ A Virginia secure systems firm called **HFSI** recently said that its general-purpose "trusted" computer system had received a B3-level rating from the **National Security Agency's National Computer Security Center.** The XTS-200 supports client/server applications and enforces security on open systems, according to the company.

Usage-based pricing gets boost

BY THOMAS HOFFMAN
CW STAFF

UNIONDALE, N.Y. — The issue of tiered pricing vs. usage-based pricing for software is drawing attention with the introduction of a software utility designed to help mainframe software vendors track how often their products are used.

Proginet Corp., a developer of connectivity software for IBM host systems, recently announced Software Meter for use with IBM's MVS/ESA operating environment [CW, June 8].

Many users have said they would welcome a change from the current tiered-pricing model to a usage-based model. Some users expressed concern over paying high licensing fees for software that is used only a few times per year or priced based on the size of the CPU of the machine that runs it.

Endless possibilities

Usage-based pricing "has tremendous merit in certain types of products, especially with products in which the size of the CPU does not correlate with the application which is used," said Tom Loane, vice president of computers and communications at Alamo Rent-A-Car, Inc. in Fort Lauderdale, Fla.

Alamo uses an IBM Enterprise System/9000 Model 900 running under MVS/ESA.

"If the industry were to adopt a means of measuring beneficial use [of software], that would be a help to the users and vendors," said David Moore, senior vice president at Mellon Bank Corp. in Pittsburgh, a large IBM mainframe shop.

One analyst said Software Meter offers tremendous benefits to users and vendors. "This type of third-party arbitration mechanism is important to both parties. It keeps everybody honest," said Frank Dzubeck, president of Communications Network Architects, Inc., a Washington, D.C., consultancy.

Dzubeck said he expects software vendors to eventually offer users two pricing structures for software — usage-based and flat-rate pricing — so users can "mix and match" the two pricing structures to work out the best deal for their shops.

Dzubeck said mainframe vendors have been wrestling with developing a usage-based pricing model for the past two years, "but no one's been able to figure out a way to deploy it until now."

Software Meter furnishes vendors with five pieces of information on customer software use: software product name, customer identification number, duration of each session of software use, frequency of use and platform size and type.

MVS/ESA-based software calls Software Meter through an application programming interface and provides usage measurements determined by the vendor. A counter stores the information in nonvolatile memory. Software Meter also incorporates security features that alert the vendor if the meter has been compromised in any way.

Software Meter will be sold to software vendors on an OEM basis beginning this month. Implementation of Software Meter requires customers to have a Network Package Switching Interface and access to a public data network.

Proginet Vice President Joseph Mohen recently said his company was engaged in discussions with at least two mainframe software vendors who would sell Software Meter as OEMs.

Computer Associates International, Inc. said it had limited communications with Proginet that eventually broke off. Sanjay Kumar, senior vice president of planning at CA, said his firm is not interested in buying Software Meter because CA engineers have been working on developing similar products. Kumar would not elaborate on CA's development activities.

Midlevel DASD line debuts for AS/400

BY KIM S. NASH
CW STAFF

WALTHAM, Mass. — IPL Systems, Inc. recently extended its product line further down the Application System/400 ladder with a DASD offering for IBM's midlevel midrange machines.

The $60 million company complemented its high-end 9606 direct-access storage devices (DASD) with the 7100 series, a line for IBM's AS/400 model 9404 minicomputer family.

Relatively few vendors other than IBM offer DASD for these machines.

Rx for savings

Lower price enticed drug store giant Walgreen Co. to buy 80 400M-byte DASD subsystems from IPL Systems, according to Don Churchill, chief information officer at the Deerfield, Ill.-based chain.

Walgreen is in the process of upgrading memory on its entire AS/400 installation, which is estimated to be more than 1,500 boxes.

Because he has found that the DASD systems for 9404 machines available from third parties are similar to those offered by IBM, "we've been buying them from whoever has the best price," Churchill said. The list includes another independent vendor that Churchill declined to identify, as well as IBM.

The 7100 line, which is available immediately, can be configured as single- or dual-disk drive modules for 9404 B, C, D and E processors, with prices ranging from $4.85 to $6.88 per megabyte of storage. The single drives are available as 320M-byte, 400M-byte or 988M-byte drives, and the dual models come in 640M-byte, 800M-byte or 1,976M-byte sizes.

New markets eyed

IPL already sells DASD products for IBM's top-end 9406 and low-end 9402 AS/400 models. But with the new 9404 line, the vendor plans to target the retail and insurance industries specifically.

These users often have AS/400-based point-of-sale setups for which extra DASD would be useful, said David DeMartinis, IPL's product manager.

The latest E series AS/400 processor, introduced in February, sports improved performance and capacity over previous models, which may help grow the market for additional disk storage, DeMartinis added.

Open or closed? You decide

CONTINUED FROM PAGE 53

analysts noted. Oracle, Sybase, Inc., The Ask Cos.' Ingres Products Division and Informix Software, Inc. have rollout schedules that ship versions for hardware platforms in waves. Some platforms get the latest RDBMS months before others, causing frustration in mixed-hardware shops.

When users of independent RDBMS packages do choose open platforms over proprietary systems, cost savings from cheaper hardware is often cited as the rationale. At BP Exploration (Alaska), Inc., an investment of $1.5 million in Unix workstations is expected to save $2.5 million in annual operating costs. BP Alaska is using IBM's RISC System/6000s as Sybase database servers and Apple Computer, Inc. Macintoshes as clients.

IS managers in the open systems world are seeing greater opportunities to buy packaged applications software and write new applications using fourth-generation languages.

Red Devil, Inc. in Union, N.J., is nearly finished replacing its IBM mainframe's homegrown manufacturing and financial systems with packaged Unix applications from IIS Corp. The packages will run on top of an Oracle RDBMS, AT&T Series 7000 Unix machines will be the servers, and personal computers running Lotus Development Corp.'s 1-2-3 will be the clients.

John Coff, Red Devil's director of MIS, said the removal of the firm's IBM 4361 will save thousands of maintenance dollars — and cut the operations staff from 14 to one.

Give both a try

A brand-new venture gets the chance to hand-pick the elements of its IS infrastructure. Encompass, a global joint venture between AMR Corp., the parent of American Airlines, rail company CSX Corp. and PTT Telecom in the Netherlands chose to link open and closed database systems through client/server applications.

The host systems are DEC VAXs, which connect with Intel Corp.-based PCs running OS/2 and IBM's RS/6000 Unix workstations. "We have adopted a message-bus technology that allows our applications to be independent of the database and independent of the network," said Rick Poff, vice president of development and operations at the Cary, N.C., venture.

The VAXs run Sybase's SQL Server database software, as will the RS/6000s; the IBM OS/2 computers run IBM's Database Manager for OS/2. Encompass elected not to run DEC's less-expensive Rdb because of the need to deploy database applications on three types of hardware. "Sybase goes across many platforms," Poff said. "Rdb does not."

Applications development is carried out by 120 programmers using the Uniface Corp. fourth-generation language and Objective C. "One developer in our environment is doing what four to five can do elsewhere," Poff said.

Encompass' systems, based on AMR's Sabre system technology, book reservations for freight shipments and track those shipments along the way. "It's a logistics system that allows trading partners to plan, to execute and to analyze their shipment pipeline," Poff explained.

Among Encompass' customers are Fortune 500 companies, and each of them gets a small Encompass database server in its headquarters.

HP updates MPE/IX operating system

BY MARK HALPER
CW STAFF

PALO ALTO, Calif. — Hewlett-Packard Co. last week introduced an upgraded version of its proprietary minicomputer operating system, serving notice that, at least for now, it is not putting all of its large systems eggs into a Unix basket.

Many of the enhancements that HP is building into MPE/IX Version 4.0 are aimed at making both the operating system and the HP 3000 series on which it runs less susceptible to system crashes and data corruption and therefore more palatable to data center users.

HP also added support for the Unix networking interface Berkeley Sockets Version 4.3, continuing a company trend of facilitating MPE/IX coexistence with Unix environments. That trend included the addition of Posix compliance last fall and includes planned support for the Distributed Computing Environment, the Distributed Management Environment and X/Open Consortium Ltd.'s XTP transaction processing standard.

But HP focused attention last week on the reliability upgrades and denied speculation that the company has any near-term plans to run a Unix kernel on the 3000, a move that would veritably meld the 3000 line with the Unix-based HP 9000 series.

Richard Sevcik, general manager of HP's Commercial Systems Division, said MPE/IX remains better suited for mission-critical applications than does HP/UX, the Unix implementation for the HP 9000. While HP is striving to make MPE/IX more interoperable with Unix and other operating systems, it intends to continue to base it in the near term on the proprietary MPE kernel, he said.

> "THE UTOPIA would be to have one operating system kernel support all environments."
>
> RICHARD SEVCIK
> HEWLETT-PACKARD

But the firm is "looking into various kernel scenarios," Sevcik said. "The utopia would be to have one operating system kernel support all environments. In the long term, that's our dream. In the short term, that's not going to happen."

HP said it plans to start shipping MPE/IX Version 4.0 by the end of this month. The company said reliabilty and data integrity enhancements include the following:

- Try/Recover routines that improve the 3000's ability to work around an application failure without shutting down.
- Aggregate parallel recovery, which speeds up operating system reboot in the event of a failure from a typical time of one or two hours on earlier versions of the system to about 20 minutes.
- Redundant arrays of inexpensive disks storage.

Connectivity enhancements include support for Token Ring. HP also added PU2.1 capabilities to the MPE/IX's LU6.2 application programming interface feature, which the company said gives the 3000 peer-to-peer communications with Application System/400s and other IBM systems.

HP said other improvements include increases in maximum terminal support from 850 to 2,300, in concurrent processes from 3,119 to 5,460, in maximum file size from 2G to 4G bytes and in disk capacity from 85G to 690G bytes.

NEW PRODUCTS

System software

Integrated Solutions, Inc. has announced Graphical Systems Manager 3.0 for the Digital Equipment Corp. VAX/VMS and Unix markets.

The product is a graphical user interface system for enhancing DEC Command Language and Unix Shell commands and managing systems in a distributed or client/server environment. Major changes in this release include an enhanced display server, expanded functionality for open systems and an increased number of display windows and templates for system management functions.

Prices range from $750 to $19,000.

Integrated Solutions
1020 Eighth Ave.
King of Prussia, Pa. 19406
(215) 337-2282

Ergodic Systems haa released MDS32, a menu design system for the Digital Equipment Corp. VAX/VMS.

MDS32 allows users to develop personal computer-quality menu interfaces to VMS-based applications. New capabilities include the ExpressMenu, a design tool that lets users interactively design and edit an MDS32 application on any ANSI term. ExpressMenu uses function keys, drag-and-drop positioning, pop-up dialog boxes and tool bars.

Another new feature is the condition test, which provides a way to implement security within an MDS32 application. A directory navigator and new user-based licensing options have also been included.

Single-user personal-use licenses for MDS32 cost $315.

Ergodic Systems
23666-A Birtcher Drive
El Toro, Calif. 92630
(714) 380-9719

Database management

Micro Decisionware, Inc. has announced Database Gateway for DB2 Release 2.0 and DB2-CICS Access Server Release 1:4.

The components were designed to help users who are integrating DB2 and other mainframe sources in client/server applications. Enhancements to the Database Gateway for DB2 and DB2-CICS include Data Compression, Multiple Host Transaction identifications and Temporary Storage Management, which bypasses CICS temporary storage, providing a way for results to return directly to the client.

The Database Gateway for DB2 costs $4,995. Pricing for the DB2-CICS Access Server ranges from $48,000 to $125,000.

Micro Decisionware
2995 Wilderness Place
Boulder, Colo. 80301
(303) 443-2706

Allen Systems Group, Inc. has announced Sedit.DB, an integrated workbench product for the DB2 environment.

Sedit.DB assists users in performing daily development, testing and DB2 management processes. It works in a Dialog Manager application with an ISPF-compatible editor.

Sedit.DB's features include formatted editing for data entry, a screen design facility that modifies the display and a catalog query facility. Fill-in-the-blanks DB2 object maintenance and DB2 security administration are also included.

The product includes formatted editing for data entry and a screen design facility for modifying the display.

Prices for Sedit.DB range from $18,700 to $27,500.

Allen Systems Group
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Silico-Magnetic Intelligence Corp. has announced two products: the Better-C Version 3.0 program generator for C/C++ and the Top-Down Designer Version 2.0 computer-aided software engineering design tool for C/C++. Enhancements include C++ code generation for Better-C, and Top-Down Designer has been augmented to support object-oriented design specific to C++. The Better-C Version 3.0 package consists of a tutorial, library source, program generator and files. Top-Down Designer Version 3.0 consists of interactive designer software and a tutorial.

Better-C Version 3.0 costs $195, and Top-Down Designer Version 3.0 costs $399.

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23 Dir./Mgr. Sys. Development, Sys. Architecture
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BUYERS' SCORECARD

FileNet surges ahead in imaging satisfaction

BY DEREK SLATER
CW STAFF

FileNet Corp.'s WorkFlo leapfrogged over Wang Laboratories, Inc.'s Wang Integrated Imaging System (WIIS) to top the Buyers' Scorecard survey on integrated image processing software.

Wang's WIIS won a similar survey last December by a comfortable margin. This year, however, WorkFlo topped most areas of the survey and finished with an overall score of 79, followed by Wang's WIIS at 76 and IBM's ImagePlus at 72. The 79 score represents a two-point climb for WorkFlo over last year's survey, when the FileNet product finished at 77. The overall WIIS score reflects an eight-point drop from last year. IBM's score was three points lower than last year.

Buyers' Scorecard reflects users' satisfaction with their installed technologies. Users assigned ratings on a scale of 1 to 10 in 17 specific categories. The users also rated the importance of each category. (See the methodology on the next page for a description of the scoring process.)

WorkFlo's biggest area of improvement over last year came in capacity to handle work load, rising from a 7.8 rating to an 8.5 rating this year. This change is in large part because of two capacity upgrades of FileNet's Unix Image Server. The latest version, released in May, has twice the capacity of the previous line.

Other jumps for WorkFlo were in compatibility with installed systems (rising from 7.5 last year to 8.1) and overall speed of processing (rising from 7.4 to 7.9).

WorkFlo earned consistently high ratings in the areas users noted as most important. WorkFlo's lowest scores came in optical character recognition (OCR) and forms processing, an area in which none of the products fared particularly well, and in compatibility with other vendors' equipment.

Slightly more than 50% of the FileNet respondents run their imaging applications on Unix servers with Unix-based or personal computer clients. FileNet recently announced enhancements to its desktop software products, and 18% of the FileNet users reported that they intend to run their imaging applications entirely on PC networks within a year.

Wang's scores fell most significantly in satisfaction with the responsiveness of vendor service (from 9.0 last year to 7.9) and quality of technical support (from 8.6 last year to 7.9), although several users expressed their satisfaction with Wang's support in verbatim responses.

Despite some dissatisfaction with the proprietary nature of the company's VS hardware, Wang's respondents by and large said they do not intend to defect during the coming year. Only 13% of the Wang users surveyed indicated that they will move their imaging applications away from the VS to other systems. Similar percentages of WorkFlo and ImagePlus users said they plan to switch hardware platforms.

Meanwhile, Wang continues to expand its support for new systems under the company's Open/image strategy. Recently the Lowell, Mass.-based company announced support for IBM's RISC System/6000 platform, which analysts foresee as a critical imaging platform in coming years [CW, June 22]. Wang's implementation will let users operate a central VS system to run imaging applications while RS/6000 units function as image servers. The RS/6000s will be relabeled as Wang RISC Series Servers.

ImagePlus' 72 score is three points lower than last year's result. However, in the most important categories, buyers rated the product about the same as last year, and ImagePlus jumped notably in the area of ease of use (7.4, compared to 6.8 last year). Declines came in OCR and forms processing (4.7, down from 5.4), text-retreival features (6.4, down from 6.9) and overall cost of purchase and implementation (5.9, down from 6.2).

IBM's software runs on several platforms, but a great majority (76%) of the ImagePlus respondents reported using a mainframe or Application System/400.

Overall, 83% of the users said their imaging systems delivered the increase in productivity that they expected when they purchased them. IBM, Wang and FileNet are the pioneers of image processing, with more than 500 installations each. ●

Integrated imaging software

Total scores reflect average user ratings for all measured areas, weighted by user-assigned importance. Response base: FileNet, 37; Wang, 32; IBM, 43

Total possible score **100** Mean score **76**

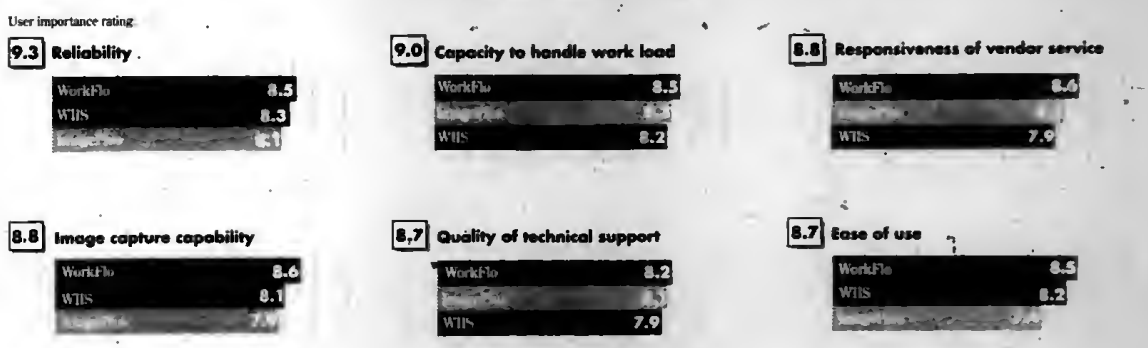
Product	Highest ratings	Lowest ratings
FileNet's WorkFlo SCORE **79**	Work-flow management	OCR and forms processing features
	Responsiveness of vendor service	Compatibility with other vendors' equipment
	Image-capture ability	Cost of purchase and implementation
Wang's WIIS SCORE **76**	Reliability	Compatibility with other vendors' equipment
	Capacity to handle work load	OCR and forms processing features
	Ease of use	Overall cost of purchase and implementation
IBM's ImagePlus SCORE **72**	Capacity to handle work load	OCR and forms processing
	Responsiveness of vendor service	Overall cost of purchase and implementation
	Reliability	Text-retrieval features

RATINGS IN ORDER OF IMPORTANCE

FileNet's WorkFlo sweeps the first six areas with consistent ratings. Users rate reliability and capacity to handle work load as key issues in imaging applications.

(Additional ratings on next page)

User importance rating



RATINGS IN ORDER OF IMPORTANCE

(Integrated imaging software, continued from previous page)

WorkFlo maintains high ratings, placing first or second in all remaining categories.

8.5 Compatibility with installed systems

8.4 Overall speed of processing

8.3 Work-flow management features

8.0 Overall cost of purchase and implementation

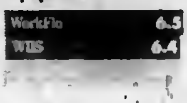
7.9 Application development tools

7.9 Depth and accessibility of documentation

7.7 Amount of customization required

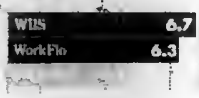
7.5 Ease of installation

7.2 Compatibility with other vendors' equipment



6.3 Text-retrieval features

6.2 OCR and forms processing features



Verbatim

What do you like best/least about this product?
(Based on the most frequently stated answer. Quotes are selected from users' responses.)

[redacted]

Likes

Work-flow controls
"We can develop applications that also measure and manage business activities."

Dislikes

Not flexible
"It lacks flexibility in reporting what it has indexed."

[redacted]

Likes

Ease of use
"It's menu-driven and easy to use."

Dislikes

Not flexible
"We'd prefer a generic application instead of having them come in and customize it for us, which is more expensive."

[redacted]

Likes

Integrates well with existing systems
"We like the way it integrates into all of our systems."

Dislikes

Not flexible
"The front-end work-flow manager is not flexible enough."

Loyalties

Would you buy the product again?
(Reasons based on most frequently stated responses)

[redacted]

Responses: 37

37 — **Likely**
The reason: Good support

Number of respondents

[redacted]

Responses: 31

27 — **Likely**
The reason: Meets our needs

4 — **Unlikely**
The reason: Product is not going to remain strong in the market

Number of respondents

[redacted]

Responses: 42

37 — **Likely**
The reason: Meets our needs

5 — **Unlikely**
The reason: Poor overall design

Number of respondents

Vital statistics

Total number of respondents: 112

What is your position?

IS director	16
IS manager	22
Project manager	35
Technical support	7
End user	9
Other	23

What is your responsibility for imaging systems?

Evaluate or recommend vendors	97
Determine need	87
Set standards for your company	85
Select vendors	82
Establish purchase agreements	59

How many years have you been involved with imaging sysems?

Less than 1 year	8
1 - 2 years	35
3 - 4 years	43
5 or more years	24
Don't know	2

In what industry does your company do the majority of its business?

Government agencies	34
Insurance	23
Financial services	13
Manufacturing	7
Banking	6
Transportation	5
Other	31

METHODOLOGY

Products included in this Buyers' Scorecard are the Top 3 market-share leaders among integrated image processing systems.

User names were provided by nonvendor sources. First Market Research in Austin, Texas, conducted the survey and tabulated the results. The response base was 37 users for FileNet, 32 for Wang and 43 for IBM.

To compute the overall score for each product, perform the following steps: 1) Multiply the product's score in the first category by the user importance rating for that category to obtain the weighted score. 2) Repeat the process for all remaining categories. 3) Average the resulting figures for the average weighted score. 4) Convert the average weighted score to base 100. The ratio of the average weighted score to the average user importance rating is equal to the ratio of the overall score to 10. Numbers are rounded off where necessary.

RESPONDENT PROFILE

Respondents reported using the following hardware platforms: Wang or other minicomputer, 27; IBM AS/400, 24; Unix server, 19; mainframe, 11; PC network, 6; other, 25.

More than half of the respondents said they view increased productivity as the most important benefit obtained from their image processing software. Improved speed and improved customer service, as well as increased storage space, were also cited as benefits.

Primary applications addressed by these imaging products include insurance, accounting, storage and retrieval, customer service and inventory/order entry.

Respondents said they would like to see the following features added to their products:

- More open systems.
- More functionality.
- Better voice or image annotation support.
- Better documentation.
- Better integration capabilities.
- Higher speed.
- Enhanced scanners.
- More color capabilities.
- Integrated work flow.
- More connectivity.

ACKNOWLEDGMENTS

Computerworld thanks the following individual and firm for their assistance in preparing this Buyers' Scorecard: Bruce Silver, BIS Strategic Decisions; CW Database Division.

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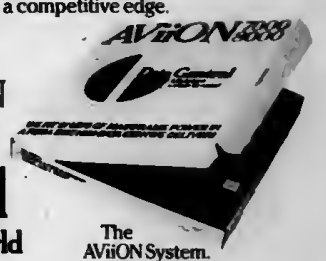

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Eiffel to add speed, application builder

BY MELINDA-CAROL BALLOU
CW STAFF

GOLETA, Calif. — Interactive Software Engineering, Inc. (ISE) is scheduled to announce and begin shipping a new release of the company's Eiffel object-oriented software development environment next week. According to company officials, the release significantly shortens compilation times and offers an application builder.

The components of Eiffel 3.0 include EiffelBench, the programming environment that offers an incremental compiler/interpreter; EiffelBuild, an application builder; EiffelVision, a class library for development of graphical applications and user interfaces; EiffelBase, with basic class libraries; EiffelStore, a class library for database interfacing; EiffelCase analysis/design tools; and ArchiText structured document constructor.

New with Version 3.0 is ISE's Melting Ice technology, which allows developers to execute applications as they are being built rather than having to wait for them to be compiled.

"One of the complaints about Version 2.3 was that it was a compiled environment, and people had to wait for applications to compile before they could test their [new code]," said Philippe Stephan, chief engineer at ISE.

"Now you start with the compiled system — the frozen system — and then during the day, as you make changes, what you change is interpreted. Eiffel also checks a program before executing it," Stephan said.

GUI builder

The new EiffelBuild interactive application generator is a program that lets users design graphical user interfaces and then link them with Eiffel code. The links between the user interface objects and the code "are accomplished via a drag-and-drop mechanism, which lets you link any graphical object to any Eiffel code," Stephan said. The product supports both the Open Software Foundation's Motif and Sun Microsystems, Inc.'s Open Look X Window interface.

ISE's Eiffel 3.0 *includes Melting Ice technology that allows developers to execute applications as they are being built*

Also new with this version are libraries that have been added around reusable components: the EiffelVision library and EiffelStore, which lets users interface with databases, including those from Oracle Corp., Informix Corp. and Versant Object Technology.

Users said they were enthusiastic about the new version of Eiffel.

"The length of compile and link time has always been a problem, not just with Eiffel but with other object-oriented languages as well, such as C++," said Dave Butler, a consultant at Sandia National Laboratory in Albuquerque, N.M. "If 3.0 performs as advertised with the Melting Ice technology, it will be an extremely desirable development environment indeed, and we are eagerly awaiting it."

The new version is slated to ship next week for Unix, VMS and AIX. EiffelBench and EiffelBuild are both priced at $995; EiffelBase and ArchiText are $495 each; EiffelVision is $1,495; EiffelStore and EiffelCase are $1,995 each.

CA's strategy to merge Xbase line begins to gel

BY THOMAS HOFFMAN
CW STAFF

NEW YORK — Computer Associates International, Inc.'s plans are coming together for the merging of its Xbase product line with the products of the recently acquired Nantucket Corp.

CA's two-pronged strategy will eventually bring the two product families together under a long-range project initiated by Nantucket.

CA Chairman and Chief Executive Officer Charles B. Wang said the company will offer its Xbase users two paths to reach its ultimate Xbase environment: the object-oriented programming path of CA-Clipper and the graphical user interface path of CA-dBFast with Microsoft Corp. Windows support. Both paths will eventually lead to CA's next-generation Xbase platform, Aspen.

"We see two paths to the Xbase world: object-oriented programming and graphical user interface," Wang said. He added that both paths provide users with immediate benefits while protecting and leveraging users' investments in application development with the eventual migration to Aspen.

Wang added that all of CA's Xbase products, which now run under Windows, will eventually be ported over to IBM's OS/2 2.0, Unix System Laboratories, Inc.'s Unix and the Open Software Foundation's Motif operating systems as well.

Aspen, which was being developed by Nantucket prior to the acquisition, will be equipped with an object-oriented language, a native code compiler, an integrated development environment and the dBFstyle used by Borland International, Inc.'s dBase product line and client/server databases. Aspen will be available under Windows first, followed by versions for OS/2 and other platforms. Compatibility kits for applications in other Xbase environments, including dBase III and IV and Fox Software, Inc.'s FoxPro, will also be available.

Development path

Wang said Aspen will be demonstrated at Comdex/Fall '92 in November and is scheduled to be available for beta testing in the fourth quarter. Wang said CA intends to deliver Aspen to its customers in the first quarter of 1993.

That's good news to independent software vendors and users who have been waiting anxiously for Aspen to hit the scene. Many users breathed a sigh of relief in May when CA announced its intention to acquire Nantucket.

Although users interviewed said they were satisfied with Nantucket's Clipper environment, they said they felt uncertain about the firm's financial status and its ability to meet development and shipping deadlines.

"The state of Nantucket's finances made it difficult for them to continue to develop and upgrade Clipper," said Al Acker, a senior software analyst at Cybernetics, Inc., a Grand Junction, Colo.-based Clipper application software developer.

Initially, a small percentage of Clipper users reacted unfavorably to CA's acquisition of Nantucket, Acker said, because these users had developed relationships with Clipper engineers. Wang said CA has retained almost all of Nantucket's Clipper developers. In fact, Nantucket President Larry Heimendinger is staying on with CA as director of Xbase strategies.

Acker said most Clipper users look favorably on the acquisition. He said he is impressed with CA's strategic direction with Clipper and Aspen because the $1.4 billion Islandia, N.Y.-based software giant has the financial resources to expand the Xbase product set beyond Nantucket's capabilities. If CA "follows through on their statement of direction, I view it as good news," Acker said.

According to Wang, CA-dBFast, which is currently available in Version 1.7C, will be upgraded to Version 2.0 by November for release at DevCon, a Nantucket independent software developers' conference for Clipper in Boston.

Enhancements for CA-dBFast 2.0, now in beta testing, will include an active dictionary/repository, a visual application designer, a visual report designer and improved performance of the database engine.

Cadre backs UnixWare, agrees to port Teamwork

■ **Cadre Technologies, Inc.** endorsed **Univel**'s UnixWare, an operating system for Intel Corp.-based desktops and servers co-developed by **Unix System Laboratories, Inc.** and **Novell, Inc.** Providence, R.I.-based Cadre will begin to port Teamwork, a family of application development tools, to UnixWare when it receives an early copy of the system, which is expected this year. Meanwhile, Westboro, Mass.-based **Hyperdesk Corp.** announced that its Hyperdesk Distributed Object Management System will support UnixWare.

■ **Visible Systems Corp.** added forward and reverse engineering features to Visible Analyst Workbench, a suite of computer-aided software engineering (CASE) tools. The Waltham, Mass.-based company, which specializes in CASE tools for **IBM**'s Application System/400 line, said the product lets users build data models for planning and generating applications in C language, Cobol and IBM's Cross System Product External Code Format.

■ Progressive Application Renovation, a graphical user interface builder from Burlingame, Calif.-based **Mozart Systems Corp.**, is now available from three consulting firms: Marathon Systems, Segue Partners and Information Integration Consulting.

■ **Lufthansa German Airlines** has licensed Canadian Plus, a frequent-flier system from Canadian Airlines. The system is based on a template developed with **Texas Instruments, Inc.**'s Information Engineering Facility CASE workbench.

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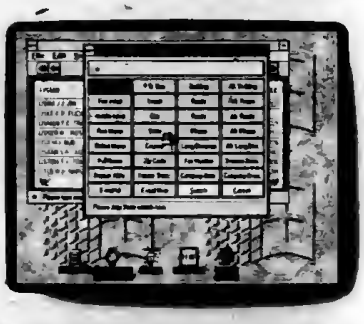
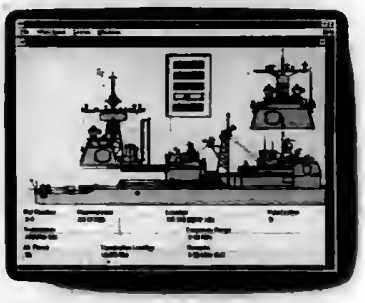


CHEVRON

Chevron's LAN system clients asked for a PC-based corporate directory to give PC users a "phonebook" similar to the one on their mainframe. The problem was there was no solution on the market that could accommodate 45,000 records with 30 fields each. To solve their problem, they used Visual Basic,™ MicroHelp Muscle for Visual Basic, VBTools, EditTool, ButtonTool, and Ramia Data Manager to create CLSctn for Windows. Now the users have an easy-to-use directory that allows them to access information by several different indexes.



U.S. NAVY

Navy ships were drowning in paper. The Chief of Naval Operations has estimated that it was costing $400 million per year to store, access, control and update the vast amounts of required technical information. Using Microsoft C, the Windows SDK, Microsoft Word for Windows and Excel, they developed the Interactive Electronic Technical Manual. It allows them to store all of the volumes of technical information on a CD-ROM, which can be accessed with the click of a mouse.

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bout the problems We'd like to talk about e solutions.

Orlando Health Care Group

Orlando Health Care is a 52-physician practice providing HMO services at 6 medical facilities. They had a problem tracking and updating over 100,000 medical charts, because patients can receive services at any of the facilities. So they used Microsoft Visual Basic, Q+E™ Database Library, Microsoft SQL Server, Microsoft LAN Manager, and Select Comm Server to create the Master Patient Index, a systemwide database. The new system saves time and helps the company provide better quality health care.

PHH Fantus

As an economic development consulting company, PHH Fantus analyzes enormous amounts of data. Some of their studies require the analysis of over 450 industries, and with the old manual system, it could take over 200 man-hours. To make their operation more efficient, they used Microsoft C, the Windows SDK and db VISTAIII Database Management system to design "Forté," a giant repository for data on a network server which is continually maintained and updated. Analysis that once took weeks now takes just hours.

Ansett Australia

As an airline, Ansett Australia needed to provide a better information system for its users. The old system forced users to wade through a large printed book for flight information. To solve this problem, they created the Ansett Travel Planner, with Microsoft Visual Basic, Windows SDK, Microsoft BASIC Professional Development System. Now it's much easier to update and access flight information. And there's a database that can store travel prefererences for customers.

Otis Elevator

Senior Management needed a more accurate and timely way to consolidate all the financial information that was coming in from Otis companies around the world. So they used Microsoft C and Microsoft Excel along with Bridge Tool-Kit™ and Keyworks to create CFO, an executive information system. Now the analysts and executives can quickly access important data that'll allow them to spot and react to business trends.

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Information Builders targets Windows

BY THOMAS HOFFMAN
CW STAFF

NEW YORK — Information Builders, Inc. (IBI) recently introduced performance boosts for its application development environment with the debut of Level5 Object Release 2.5 for Microsoft Corp.'s Windows 3.0 and 3.1.

The software is an object-oriented, knowledge-based application development tool that IBI upgraded from its earlier Release 2.2. IBI has added new data interfaces and performance improvements in the upgrade.

"The new version is a lot better than Release 2.2 because you can move your screens onto the mainframe," said Jerry Kessler, project leader of the application consulting team at Navistar International Corp., an Oak Brook Terrace, Ill.-based manufacturer of truck and diesel engines. Kessler was referring to Release 2.5's ability to access remote mainframe data in addition to its direct data access capabilities with personal computer databases.

Kessler beta-tested Release 2.5 for three months before purchasing the product last month to upgrade Navistar's copy of Release 2.2. He noted other improvements over Release 2.2, including better performance, better object structure and improved compiler messages. Kessler said Navistar is considering using Release 2.5 to convert its Level5 Object Release 1.3 users who require IBM mainframe data access.

According to Sean McCarthy, a marketing manager at IBI, the Windows development tool also enables users to achieve distributed data access with IBI's Enterprise Data Access/SQL 2.0, a client/server software package and a part of IBM's Information Warehouse. Release 2.5 also supports full implementation of SQL and offers a Dynamic Data Exchange interface, which is one of several interfaces included with the new package.

McCarthy said the added features were implemented as a result of user requests. "In Windows, everything is changing so rapidly that vendors are trying to compete with new features all the time," McCarthy said. He added that IBI is currently beta-testing an MVS version, which is slated to ship next month.

In addition to its ability to run in Windows 3.0 and 3.1 environments, McCarthy said Release 2.5 also works in Windows running under IBM's OS/2 2.0 operating system.

Level5 Object Release 2.5 is available now, and it is priced at $995 for the development system.

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Cadre releases DB Designer 3.1

An updated database re-engineering tool from Providence, R.I.-based Cadre Technologies, Inc. can reportedly convert flat-file databases to a relational model.

According to company officials, the new version of DB Designer can derive business rules and entity relationships from flat-file databases — such as IBM's VSAM and IMS and Computer Associates International, Inc.'s CA-IDMS — and prepare them for use with relational products such as IBM's DB2, Informix Software, Inc.'s Informix, Oracle Corp.'s Oracle and Sybase, Inc.'s SQL Server.

Previously available only for IBM's OS/2, DB Designer Release 3.1 now supports the Sun Microsystems, Inc. SPARCstation line of workstations. Prices for the new version of the tool, which is shipping now, begin at $20,000.

NEW PRODUCT

Application development tools

Dragonfire Software Systems has released Version 1.0 of the PC/Cobol Toolkit, a set of library routines.

The product was designed for users with PC/Cobol compilers based on the Micro Focus Cobol/2 Compiler. Callable routines that verify disk and printer status, perform screen I/O, retrieve directory listings and free disk space and available memory are features included in this release. The PC/Cobol Toolkit costs $50 without the source code, $100 with it.

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The joy of X . . . terminals

The X environment — once mysterious to commercial sites — turns out to be user-friendly as it starts to serve some very everyday needs

BY STEPHEN AUDITORE

Maybe it's the letter "X." Maybe it's their roots in an MIT research project called "Athena." Whatever the reason, for a lot of commercial users, X terminals are shrouded by some mystery.

In reality, there's nothing overly exotic about the work being done by these intelligent, diskless devices. In fact, they're helping users perform some pretty down-home tasks in areas such as computer-aided software engineering, computer-aided design, database query, on-line transaction processing and groupware. They're also shipping in larger numbers than ever before, with nearly 120,000 X terminals sold in 1991, up from 12,000 units shipped in 1989.

On the other hand, an X terminal is not your basic terminal. It was designed explicitly to run the X Window System, a hardware- and network-independent windowing and graphics protocol — now a de facto industry standard — that allows users to view all systems computing elements on a single screen as if they were one large computer.

X terminals running X allow users to simultaneously view many different applications residing on heterogeneous computers across the network also running the X Window System. The X terminal itself does not process the applications; it performs all the tasks necessary to display them in a graphical way on its high-resolution screen.

Backward world

In some ways, entering the X world can be like walking through the looking glass. For one thing, the concept of client and server are reversed. An X terminal — a desktop device — comes bundled with its own proprietary version of what is called X "server" software. The software sends and receives X protocol commands to the machines on the network, called "hosts," that run the applications — known as the "clients." This is because, technically speaking, the networkwide clients are sharing the "server" resource of a high-bit-mapped display.

You don't need an X terminal to deliver X-based applications to the desktop. You could use a workstation or a personal computer running X server software (see story page 69). But generally, workstations are more expensive than X terminals to purchase, maintain and support, while PCs are better used by people who use X sporadically.

X terminals have become an attractive option because they offer the following:

- Can be administered like a simple terminal.
- Offer a lower cost seat.
- Are easier to administer and support.
- Do not need to be upgraded whenever a new generation of workstation becomes available.

John Ahern

All this probably sounds great, but there are some drawbacks — real and perceived — to using X. For one, there is a lack of X-based commercial applications. However, most X applications will likely be mission-critical, proprietary applications, such as billing, planning, customer service and documentation systems. The key applications driving the acceptance of X in the commercial sector will not be third-party, shrink-wrapped applications but database management systems and fourth-generation languages that support X. **Oracle Corp.** and The Ask Cos.' **Ingres Products Division** already offer products that support X-based database application development.

Some people also bemoan the impact of X terminals on the network and the hosts they rely on for processing. However, it's the application that determines the traffic level, not the total number of X terminals on the network. The more windows, or applications, that are opened simultaneously, the more resources are required. Other factors that affect network traffic include the type of window activity and the amount of information sent to a window.

One way that X terminal vendors are working to minimize network traffic is to use local window managers; that is, the processing required to manage the terminal's windows is performed on the terminal rather than somewhere across the network. If the window manager runs on the host, high levels of window activity can increase network traffic.

Keep in mind, however, that the very nature of X — highly user-interactive — creates a sporadic-burst pattern, which should minimize its impact on the network loading.

Selecting an X terminal

Unlike traditional terminals, an X terminal is not a display product. The size, resolution and type of display is certainly important; most nontechnical customers settle on midsize color displays (16 to 17 in.), with 1,024 by 768 or 1,280 by 1,024 pixels, supporting eight-bit planes of color.

But an X terminal is actually a

Continued on page 68

INSIDE

Best of Both Worlds
You can have your PCs and X Window System, too. Page 69.

Three Tales of X
From vendor support to wiring to configuration travails. Page 76.

Product Guide
A comprehensive listing of color X terminal models. Page 75.

Auditore is president of the X Business Group, Inc., a market research and consulting firm in Fremont, Calif.

The joy of X . . . terminals

CONTINUED FROM PAGE 67

software and network product. A successful deployment of X terminals relies on the software and the degree to which the device affects network traffic.

The leading X terminal suppliers recognize this, with **Network Computing Devices, Inc.**, **Hewlett-Packard Co.**, **Digital Equipment Corp.**, **IBM** and **Tektronix, Inc.** all offering very sophisticated X server functionality.

Choosing among the more than 30 vendors offering more than 200 different X terminal models, then, is really a matter of checking out their software, their compatibility with your installation, their support capabilities and the ongoing administration that their terminals require.

Software variables

The current version of the X Window System is X11 Release 5.0. Few X terminal vendors are shipping this release, but X is backward-compatible, meaning that X11 Release 3.0 applications will run with X11 Release 4.0 and Release 5.0 servers.

The software components of many X terminals include the following:

Local clients. These are programs that, in the X world, have traditionally run on the network but now run in the X terminal. The rationale behind local clients is that they can reduce the host and network load by providing services that would otherwise be supplied by host- or network-resident clients.

Common local clients include window managers and terminal emulators. Nearly all X terminal vendors support local clients of various types, with **Applied Digital Data Services, Inc.** (a subsidiary of NCR Corp.), DEC, Network Computing and Tektronix offering local window managers.

When you're shopping for X server software, look for the following:

- **X11 revision:** R4 or R5.
- **Network management:** SNMP.
- **Local client support:** Window managers (Motif), terminal emulations.
- **Font server support.**
- **Network protocols:** TCP/IP, DECnet and LAT (if DEC).
- **Ease of installation:** Tape availability, installation scripts, graphical user interface-based setup, remote configuration capability.

Fonts. Until the latest release of the X Window System, font handling on X terminals was a cumbersome task. Release 5.0 improves on that by providing a font server that runs on the network. The font server processes all font requests, converting them to a common format that X terminals understand.

Network management support. Simple Network Management Protocol (SNMP) has become a de facto standard for X terminals. With SNMP support, users can monitor X terminals using standard network management programs.

While the features of the X11 server are important (see story this page), whether the software is robust is more important. Check with other customers of the supplier to see what their experiences with the X server software have been.

Supporting the load

The X server software can either be loaded from internal read-only memory or downloaded from a network-resident host. Nearly all suppliers support both methods.

There are pros and cons to each. Booting from the network can take its toll if a large number of X terminals boot simultaneously. On the other hand, it's a lot easier to upgrade the X server software when it's network-resident.

If the X terminal is booted from the network, you need to know which hosts are supported and which media are supplied. Independent suppliers Network Computing and Tektronix support nearly all major platforms. The system suppliers tend to specialize in their own platforms, except for HP, which in addition to its own systems supports **Sun Microsystems, Inc.** workstations and IBM RISC System/6000s. Look for all major X

Quick reference comparison

X terminals support X the best, but they are not as good for local applications

	X terminals	PCs with X	Workstations
Cost/Seat	$4,000-$4,500 (17-in. color monitor)	$4,700-$5,800 (16-in. color monitor, 486-33)	$5,400-$6,500 (16-in. color monitor, diskless)
Network requirements	Increase in network traffic	Increase in network traffic	Significant increase in network traffic
Host requirements	• 1M-3M bytes per X terminal • 1-3 MIPS per X terminal* • 10 times memory swap space	• 1M-3M bytes per X terminal • 1-3 MIPS per X terminal* • 10 times memory swap space	8M-16M byte swap memory on host
X performance	Good to excellent	Poor to adequate	Good to excellent
Use profile	• Heavy X • No local applications • Historically technical users • Commercial use a fast-growing segment	• Casual X • Heavy local applications	• Mixed X access • Local workstation applications
Applications	Mission-critical vertical, OLTP, publishing, database access, CASE, office automation	E-mail, database query, mission-critical vertical applications	CAD/CAM, CASE
Advantages	• Lower life cycle costs • Network-upgradable (desktop power increasing by adding capabilities to network)	• Leverage PC investment • Retain access to PC applications • Integrated w/PC environment	• Full workstation compatibility • No application compatibility issues
Issues	• No local processing capabilities • Requires network processing • Most X terminals connected via network • Cultural resistance from workstation users	• Performance of X server • Compatibility with installed PC options • Installation, ease of use • May require PC upgrade • Configuration support • Life cycle cost high	• Expensive to increase desktop capability • Not optimized for X server functionality • Life cycle cost high • Security risk • Administration difficult (backups, support)

*Application-dependent

Source: X Business Group, Inc.

X marks the vendor

BY JIM ROYNAN

The following market leaders offer a range of X terminals, from lower price monochrome to color models. Each is committed to open systems products, offering workstations and other open systems hardware and peripherals in addition to X terminals.

• Network Computing Devices, Inc.

Overview: Currently dominates the X terminal market, outselling its nearest competitor by a 2-to-1 margin. First to incorporate a reduced instruction set computing (RISC) chip. Sells directly to users; particularly strong in Sun Microsystems environments. Tends to concentrate on the middle — rather than the high — end of the market. Prices range from $1,495 to $5,395.

Weaknesses: Prices are higher than comparable X terminals from competitors. Serial port support limited to ANSI.

• Tektronix, Inc.

Overview: Has established technical dominance in the X terminal market. Historically the first to announce many new technologies, such as a 19-in. X terminal. Recently added a machine with PEX, which allows the X terminal to use client/server implementations of the standards body-approved graphics language PHIGS, or Programmers' Hierarchical Interactive Graphics. Markets its products primarily at the high end. Offers eight X terminals, ranging in price from $2,495 to $6,995.

Weaknesses: Design incorporates a separate processor unit that is cumbersome and requires the attachment of several cables for it to function. Processor unit must sit either alongside the display or on the floor. On/off and power indicators are not conveniently located nor easily visible.

• Visual

Overview: First to bring an X terminal to market and only one here that concentrates almost exclusively on X terminals. Rapid TX product line features software-selectable resolutions and timing to ensure compatibility. More than 10 X terminals in its product line, ranging in price from $995 to $6,055.

Weaknesses: The company's sales consist almost exclusively of monochrome units, which have an interlaced display, known for being tiring to the eye over extended periods of use.

• Human Designed Systems.

Overview: Awarded what is believed to be the single largest order of X terminals ever, from the U.S. Army Reserve Component Automation System (RCAS), through Boeing Computer Services, for about 50,000 of its ViewStation FX series. Tends to focus more on integrating X terminals into an environment than on direct sales to end users or distributors. Price ranges from $1,499 to $5,999.

Weaknesses: Only recently became a major X terminal maker with significant sales and revenue. Questions remain as to its ability to keep up with non-RCAS production and distribution in the wake of its recent award.

• Hewlett-Packard Co.

Overview: Has made significant strides in high-end X terminals. RISC-based models are solid and well-engineered and boast top-notch benchmark performance. With the success of its 9000 series workstation and respected X terminal line, HP is making a push into the high-performance graphics market. Prices range from $2,995 to $5,995.

Weaknesses: HP terminals, like those of Network Computing, tend to be slightly higher priced than competitive units.

• Digital Equipment Corp.

Overview: Optimized for DECwindows and VT-320-based applications. Recent announcement of the XVT 2000 line lowers the low end of its offerings from $2,195 to $1,999. The new models feature menu-driven operation, reduced network overhead and simultaneous access to Unix, Ultrix and VMS host applications.

Weaknesses: Heavy reliance on large installed base of Ultrix and VMS users to move toward open systems may preclude the company from marketing its X terminals to non-DEC users.

Roynan is an analyst at Bluestone Consulting, Inc., a consulting firm in Mount Laurel, N.J., that specializes in Unix and open systems.

terminal suppliers to offer multihost boot support in the future.

Far from being "dumb" devices, X terminals usually sport a powerful processor, often a reduced instruction-set computing (RISC) CPU. The processor is what runs the X server software, using the memory or program and session storage.

The memory in the X terminal fulfills several needs, including running the X server, storing fonts, storing dynamic information relating to windows, local clients and video memory (usually video random-access memory).

But more memory is not always better. The memory that really matters is the amount not occupied by the X server. For example, Product A may have 5M bytes in a standard configuration, while Product B has 4M bytes. But Product A requires 1.5M bytes for its X server while Product B uses only 500K bytes. Which is better? Know what the memory is used for and how it is allocated.

The amount of local memory required is based on the number of windows open, the fonts in use and the type of information in the window. If you are doing mostly textual applications with less than four windows open, 2M to 4M bytes should be adequate.

Anything else will require at least 4M bytes, and if local clients such as a window manager are added, then more is needed. For a reference point, an official Open Software Foundation Motif window manager requires approximately 500K bytes of memory.

Communications

Communications between the X terminal and the X client are effected via standard network protocols and wires. Most networked X connections use Transmission Control Protocol/Internet Protocol, using the Ethernet protocol, running on a thin, thick or twisted-pair medium.

While most of the benefits of X are derived from being on a network, many organizations still use serial connections, especially where X terminals are replacing conversational terminals. If you don't have a network and aren't going to install one but want to use X, look at products that can connect via a serial link, such as those from **Qume Corp.**, Network Computing and DEC.

It may be necessary to run an X terminal from a remote location or over a serial line. Depending on the transmission speed, supporting remote X often requires an optimized low-bandwidth X protocol. Possible protocols include Point to Point Protocol, XRemote and Serial Line Internet Protocol, or SLIP.

.....

The next generation of X terminals will feature more powerful hardware (RISC processors, expanded memory, more input devices) and will further increase its software capabilities.

Elements of the graphical user environment, such as multiple work spaces and desktop managers, will become resident in the X terminal. The X Window System will eventually become invisible to users.

Further into the future, X terminals will be replaced by terminals that are optimized for a specific user environment and interfaces. There will be Motif terminals, Open Look terminals, DECwindows terminals, Destiny terminals, HP/VUE terminals, Microsoft Corp. Windows New Technology terminals, Solaris terminals . . . and on and on. ●

Casual X: PC X servers give users a bit of both worlds

You *can* have your X and PCs, too, with personal computer-based X server software.

PC X server software allows the PC to function as an X display device while retaining its DOS and **Microsoft Corp.** Windows — or **Commodore Business Machines, Inc.** Amiga, **IBM** OS/2 and **Apple Computer, Inc.** Macintosh — functionality. So far, a good number of companies have opted for this route, with the current installed base (including **Digital Equipment Corp.**'s Pathworks) exceeding 222,000 users, with most running under DOS or Microsoft Windows.

In fact, one of the most important trends in the PC X server market has been the increased demand for Microsoft Windows-based PC X servers. Windows and X integration permits users to view DOS, X and Windows applications simultaneously and allows cutting and pasting of data and information between applications. Windows' PC X servers also allow users to employ Windows' local window manager, which lends the Windows look and feel to X applications while reducing network traffic.

But PC X servers are not for everyone. As vendors of the software have discovered, converting a PC to an X-capable device is not an easy thing; in fact, it can be more difficult than adding an X terminal to the network. For one thing, you may be in for a significant degree of upgrading, including the following:

- More memory.
- A network interface card.
- Network software.
- PC X software.
- Higher resolution displays and graphics adapters.

To achieve a reasonable level of X performance with minimal impact on the local DOS/Windows environment, you would need at least an 80386-based 33-MHz PC (in the Intel Corp. environment), with 8M bytes of random-access memory, a 14-in. color display and at least Video Graphics Array, preferably Super VGA resolution.

The fact is, PC X server software does not turn a PC into an X terminal. The inherent hardware and software limitations of PCs limit their performance and functionality as X display servers. Although PC architecture and memory management have taken some great strides, DOS is still a single-user operating system constrained by 640K bytes of conventional memory, which significantly limits application size and mulitasking capabilities.

As with workstations, networked PCs also require a higher level of attention from the network administrator than X terminals. PCs with X servers do not offer the life cycle cost advantages proffered by X terminals.

X-equipped PCs are best left for casual X application use, such as people who only need occasional access to X applications. For example, the aerospace, petrochemical and manufacturing industries often have X-based database applications — usually archives of technical manuals and documents. Since these applications tend to be for query and display purposes, not data entry and update, it's a good use for PC X servers.

X on PCs will work well for organizations with a large investment in PC hardware and software that want users to have some access to X-based information resources and database applications. This will be especially true in commercial market segments such as telecommunications, banking, insurance, financial services, hotels and the airlines.

STEPHEN AUDITORE

X on the PC

The following are a sampling of PC X software vendors

AGE Logic, Inc.
San Diego
Xoftware for DOS and Windows

Apple Computer, Inc.
Cupertino, Calif.
Mac/X for Macintosh

GFXBase
Milpitas, Calif.
GFXbase for the Amiga

Hummingbird Communications Ltd.
Markham, Ontario
HCL-Exceed for DOS and Windows

Network Computing Devices, Inc.
PC-X Division
Mountain View, Calif.
PC Xview for Windows and DOS

Visionware (Unipress Software, Inc.)
Edison, N.J.
Xvision for Windows

White Pine Software, Inc.
Nashua, N.H.
Exodus for the Macintosh

Source: X Business Group, Inc. CW Chart: Janell Genovese

Performance — Xstones vs. the Rolling Stones

No matter how hard vendors have tried to promote a single-number benchmark for X terminals, one does not exist.

Some suppliers (usually those with the biggest number) have been promoting "Xstones." Xstones is derived from an X server development tool called "X-bench," developed by Siemens/Nixdorf Information Systems, Inc. It shows the performance of the X server software in a computer-aided software engineering (CASE) environment and does not factor in a non-CASE environment, user interaction and network traffic.

Another benchmark in use — developed and maintained by DEC — is X11perf. This suite of more than 400 tests provides ratings of how well the X server performs various X primitives. Several of these ratings have been grouped into values called "DXUPs." By evaluating the application against the DXUPs, you can garner some idea of how well X terminals will run that application relative to each other.

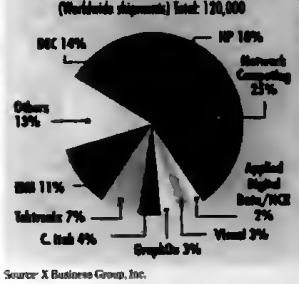
Hewlett-Packard Co.'s Panacom Division has published several application- and terminal-specific performance test papers that provide more insight into X terminal and system performance than any of the benchmark programs in use.

STEPHEN AUDITORE

Piece of the pie

Network Computing commands the largest market share by far

1991 X terminal shipments by supplier
(Worldwide shipments) Total: 120,000



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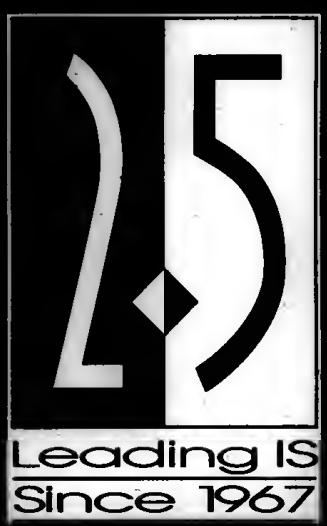

1992 Computerworld Editorial Calendar (July-December)

Issue Date	Ad Closings Color*	Ad Closings B/W	Editorial Feature	Show Distribution	Ad Readership Issue	Response Card Decks
July 6	June 19	June 26	**Product Spotlight:** X Terminals **Buyers' Scorecard:** Integrated Image Processing Software		Starch Study	
July 13	June 26	July 3	**Executive Report**			Mails: July 15 Space Close: June 5 Mat'l Close: June 8
July 20	July 3	July 10	**Product Spotlight:** New Generation of Word Processing Software **Buyers' Scorecard:** Object-oriented Programming Software	Communication Networks West & Object World July 21-23, San Francisco	Starch Study	
July 27	July 10	July 17	**Executive Report**			
Aug. 3	July 17	July 24	**Product Spotlight:** Inventory Management Software **Buyers' Scorecard:** Full Life-cycle CASE			
Aug. 10	July 24	July 31	**Industry Closeup:** IS in Banking **Executive Report**	Windows OS/2 Aug. 12-14, Boston	Starch Study	Mails: Aug. 12 Space Close: July 3 Mat'l Close: July 6
Aug. 17	July 31	Aug. 7	**Product Spotlight:** Object-oriented PC Development Tools **Buyers' Scorecard:** Large-capacity Mainframes			
Aug. 24	Aug. 7	Aug. 14	**Executive Report**			
Aug. 31	Aug. 14	Aug. 21	**Product Spotlight:** Peripherals for Travel (portable modems, printers, docking stations) **Buyers' Scorecard:** Mainframe RDBMS		Starch Study	
Sept. 7	Aug. 21	Aug. 28	**Special Report:** Annual Salary Survey			
Sept. 14	Aug. 28	Sept. 4	**Special Report:** Annual Job Satisfaction/Job Performance Survey **Special Supplement:** Annual *Premier 100* Magazine		Starch Study	Mails: Sept. 16 Space Close: Aug. 7 Mat'l Close: Aug. 10
Sept. 21	Sept. 4	Sept. 11	**Product Spotlight:** The Latest Frame Relay Products and Services **Buyers' Scorecard:** 486 PCs (33 Mhz)	TCA Sept. 21-26, San Diego		
Sept. 28	Sept. 11	Sept. 18	**Executive Report**			
Oct. 5	Sept. 18	Sept. 25	**Product Spotlight:** EDI Products and Services **Buyers' Scorecard:** Disk Arrays			
Oct. 12	Sept. 25	Oct. 2	**Integration Strategies:** Integrating New Development Tools **Industry Closeup:** IS in Biotechnology	Networld Oct. 13-15, Dallas	Starch Study	Mails: Oct. 14 Space Close: Sept. 4 Mat'l Close: Sept. 7
Oct. 19	Oct. 2	Oct. 9	**Product Spotlight:** Project Management Software **Buyers' Scorecard:** Midrange Systems (10 Mips or Higher)			
Oct. 26	Oct. 9	Oct. 16	**Special Issue:** Annual *Campus Edition* **Executive Report**	Interop '92 Oct. 26-30, San Francisco PC Expo Oct. 27-29, Chicago		
Nov. 2	Oct. 16	Oct. 23	**Product Spotlight:** Work-flow Software **Buyers' Scorecard:** PC Graphical User Interfaces		Starch Study	
Nov. 9	Oct. 23	Oct. 30	**Executive Report**			Mails: Nov. 11 Space Close: Oct. 2 Mat'l Close: Oct. 5
Nov. 16	Oct. 30	Nov. 6	**Product Spotlight:** Best Buys in 486 PCs **Buyers' Scorecard:** Virus Detection Software	Comdex Fall Nov. 16-20, Las Vegas	Starch Study	
Nov. 23	Nov. 6	Nov. 13	**Integration Strategies:** Rise of the Specialist Integrator **Industry Closeup:** IS in Retail			
Nov. 30	Nov. 13	Nov. 20	**Product Spotlight:** Minicomputers **Buyers' Scorecard:** E-Mail Enabled Applications		Starch Study	Mails: Dec. 2 Space Close: Nov. 6 Mat'l Close: Nov. 9
Dec. 7	Nov. 20	Nov. 25	**Executive Report**			
Dec. 14	Nov. 25	Dec. 4	**Product Spotlight:** Windows Utilities **Buyers' Scorecard:** DASD		Starch Study	
Dec. 21	Dec. 4	Dec. 11	**Executive Report**			
Dec. 28 & Jan. 4, 1993	Dec. 11	Dec. 18	**Special Edition:** Annual Forecast Issue			

* Includes ads placed within Executive Report or Product Spotlight sections and premium positions

Please Note: Executive Report topics will be announced one month prior to ad closing. Your sales representative will provide you with specific information on each topic

Color X terminals

VENDOR	PRODUCT	SCREEN SIZE (DIAGONAL INCHES)/RESOLUTION	HOST BOOTED FROM	PROCESSOR/GRAPHIC PROCESSOR TYPE	MINIMUM/MAXIMUM RAM SUPPORTED BY X TERMINAL (BYTES)	RAM REQUIRED BY X SERVER	VIDEO MEMORY (BYTES)	FLASH PROM	SYSTEM BOOTED	X11 RELEASE SUPPORTED	REMOTE PROTOCOLS SUPPORTED	FUNCTIONS LOCALLY RUN ON X TERMINAL	LOCAL WINDOW MANAGER	BIT PLANES SUPPORTED	NUMBER/TYPE OF INTERFACES SUPPORTED	PRICE
Applied Digital Data Systems, Inc., a subsidiary of NCR Corp. (407) 333-9250	3414 X-Station Model XL 17CE	17/1,024 x 768	Sun, HP, DEC, IBM, NCR/AT&T	68020/34020	5M/20M	1.3M	1M	No	Download, prom	R4	SLIP, PPP, TCP/IP, DECnet	Font management, window management	Motif, tab window manager	8	1 serial	$3,995 base price
	3414 X-Station Model XL 15CE	15/1,024 x 768	Sun, HP, DEC, IBM, NCR/AT&T	68020/34020	5M/20M	1.3M	1M	No	Download, prom	R4	SLIP, PPP, TCP/IP, DECnet	Font management, window management	Motif, tab window manager	8	1 serial	$2,995 base price
C. Itoh Technology, Inc. (714) 757-4458	R Terminals	17, 19, 21/1,280 x 1,024	Sun, HP, DEC, IBM (any with TCP/IP)	TI 340X, TI 34020/34030	4M/38M	1M	2M	Yes	Download, prom	R5	SLIP, PPP, CSLIP	Font management, window management, color management	Motif, Open Look	8	1 serial, 1 parallel, AUI Ethernet (thin net, 10Base, 10Base-T, 10Base-2)	$3,000 - $5,800
Digital Equipment Corp. (800) 344-4825	VXT 2000 15-in. color	19/1,280 x 1,024	Sun, HP, DEC, IBM, SCO	SOC/SPX	4M/16M	4M (server-based unit)	2M	No	Download	R4	NA	Window management	Motif	8	1 serial, 1 parallel, 1 Ethernet	$5,895
	VXT 2000 17-in. color	17/1,024 x 768	Sun, HP, DEC, IBM, SCO	SOC/SPX	4M/16M	4M (server-based unit)	2M	No	Download	R4	NA	Window management	Motif	8	1 serial, 1 parallel, 1 Ethernet	$4,698
	VXT 2000 15-in. color	15/1,024 x 768	Sun, HP, DEC, IBM, SCO	SOC/SPX	4M/16M	4M (server-based unit)	2M	No	Download	R4	NA	Window management	Motif	8	1 serial, 1 parallel, 1 Ethernet	$3,495
Hewlett-Packard Co. (800) 752-0900	HP 700/RX Model 19Ca	19/1,280 x 1,024	Sun, HP, IBM, SCO	i960/None	4M/16M	2M	2M	Yes	Download, prom	R4	SLIP	None	None	8	1 serial, 1 parallel, 1 HP-HIL, PS/2	$4,995
	HP 700/RX Model 16Ca	16/1,024 x 768	Sun, HP, IBM, SCO	i960/None	4M/18M	2M	1M	Yes	Download, prom	R4	SLIP	None	None	8	1 serial, 1 parallel, 1 HP-HIL, PS/2	$4,695
	HP 700/RX Model 16Ci	16/1,024 x 768	Sun, HP, IBM, SCO	i960/None	4M/18M	2M	1M	Yes	Download, prom	R4	SLIP	None	None	8	1 serial, 1 parallel, 1 HP-HIL, PS/2	$3,995
	HP 700/RX Model 14Ci	14/1,024 x 768	Sun, HP, IBM, SCO	i960/None	4M/18M	2M	1M	Yes	Download, prom	R4	SLIP	None	None	8	1 serial, 1 parallel, 1 HP-HIL, PS/2	$2,995
Human Designed Systems (215) 277-8300	HDS ViewSystem FX	14, 16, 17, 19/1,024 x 768 to 1,280 x 1,024	All hosts; flash prom-based	i960/None	4M/72M	1M	1M, 2M	Yes	Download, prom	R4	SLIP, PPP, CSLIP	Window management	Motif, Open Look	1,8	2 serial, 1 parallel	$2,599 base price
IBM (512) 838-7900	IBM Xstation 130	12-23/640 x 480 to 1,280 x 1,024	Sun, DEC, IBM, SCO Unix	TI 34020/34020	2.5M/16.5M	600K	1M 2M	No	Download, optional 30M-byte hard file	R4	SLIP	Font management	None	8	2 serial, 1 parallel	$2,650 base price, display and software extra
	IBM Xstation 130	12-23/640 x 480 to 1,280 x 1,024	Sun, DEC, IBM, SCO Unix	TI 34010/34010	0.5M/8.5M	300K (R3), 500K (R4)	0.5M-2M	No	Download	R3, R4	None	None	None	8	1 serial, 1 parallel	$1,800 base price, display and software extra
Intergraph Corp. (205) 730-2000	InterX 550	19/1,184 x 884	Sun, Intergraph	TI 34020, 68030/ 34020	6M/24M	6M	2M	No	Download	R4	SLIP	Font management, color management	None	8	1 serial, 1 parallel	$5,300
Japan Computer Corp. (201) 562-5022	Super XR	17, 19/1,280 x 1,024	Sun, HP, DEC, IBM	R3000A/ASIC	4M/32M	2M	1M maximum	No	Download, prom	R4, R5	SLIP	Window management	Motif	8	1 serial, 2 Ethernet	$4,395 (19-in. screen); $5,395 (17-in. screen)
	Super FX	17, 19/1,280 x 1,024	Sun, HP, DEC, IBM	68030/ASIC	4M/32M	2M	1M maximum	No	Download, prom	R4, R5	SLIP	Window management	Motif	32	1 serial, 2 Ethernet	$10,995 (19-in. screen); $9,995 (17-in. screen)
	Super XL	15/1,024 x 768	Sun, HP, DEC, IBM	68020/ASIC	4M/32M	2M	1M maximum	No	Download, prom	R4, R5	SLIP	Window management	Motif	8	1 serial, 2 Ethernet	$3,195
Jupiter Systems (510) 523-9900	MX600	19/1,280 x 1,024	Sun, HP, DEC, IBM	None	4M/96M	1M	12M	No	Download	R5	None	Font management, color management	None	8	4 serial	$6,500
Link Technologies, Inc. (510) 651-8000	LX 1200	14-21/1,280 x 1024	Sun, HP, DEC, IBM	68030, TI 34020/34020	6M/37M	1.4M	2M	Yes	Download, prom	R4	SLIP	Window management	Motif	8	3 serial, 1 AUI	$2,999
Network Computing Devices, Inc. (415) 694-0650	NCD19c	19/1,280 x 1,024	Sun, HP, DEC, IBM	RISC 88100/ASIC	6M/32M	1.2M	512K	No	Download, prom	R5	X/Remote, SLIP	Font management, window management, color management	NCD Work Manager	8	1 serial, Ethernet (thin, thick or twisted pair)	$6,395
	NCD17cr	17/1,280 x 1,024	Sun, HP, DEC, IBM	RISC 88100/ASIC	6M/40M	1.2M	512K	No	Download, prom	R5	X/Remote, SLIP	Font management, window management, color management	NCD Window Manager	8	1 serial, Ethernet (thin, thick or twisted pair)	$5,395
	NCD17c	17/1,024 x 768	Sun, HP, DEC, IBM	68020/2 ASICs	4M/32M	1.2M	128K	No	Download, prom	R5	X/Remote, SLIP	Font management, window management, color management	NCD Window Manager	8	1 serial, Ethernet (thin, thick or twisted pair)	$4,500
	NCD14c	14/1,024 x 768	Sun, HP, DEC, IBM	68030/2 ASICs	4M/32M	1.2M	128K	No	Download, prom	R5	X/Remote, SLIP	Font management, window management, color management	NCD Window Manager	8	1 serial, Ethernet (thin, thick or twisted pair)	$3,000
Northwest Digital Systems, Inc. (206) 324-0014 (800) 537-1201	NDS R Station- X20 Wildcat II	15-20/1,024 x 768, 1,152 x 900, 1,280 x 1,024, 1,600 x 1,280	Sun, HP, DEC, IBM, any Unix host	TI 340x/None	2M/16M	750K (R4), 1M (R5)	2M	Yes	Download, prom	R4, R5	SLIP	Font management, color management	None	8	2 serial	Contact vendor
	NDS R Station- X20 Wildcat	15-20/1,024 x 768, 1,152 x 900, 1,280 x 1,024	Sun, HP, DEC, IBM any Unix host	TI 34020/None	2M/16M	750K (R4), 1M (R5)	1M	Yes	Download, prom	R4, R5	SLIP	Font management, color management	None	8	2 serial	$2,795- $4,895, depending on configuration
Samsung Information Systems America, Inc. (201) 229-4000	R Terminal	14, 15, 17, 19/1,024 x 768, 1,280 x 1,024	Sun, HP, DEC, IBM	AMD 29000/None	4M/18M	2M	1M, 2M	Yes	Download, prom	R4, R5	SLIP, NFS	Window management	No	8	2 serial	$4,995 (19-in. screen), $3,995 (17-in. screen), $3,495 (15-in. screen), $3,195 (14-in. screen)

The companies included in this chart responded to a recent survey conducted by *Computerworld*. When a vendor is unable to provide specific information about its product, the abbreviation NP (not provided) is used. When a question does not apply to a vendor's product, the abbreviation NA (not applicable) is used. Contact vendor for further product information.

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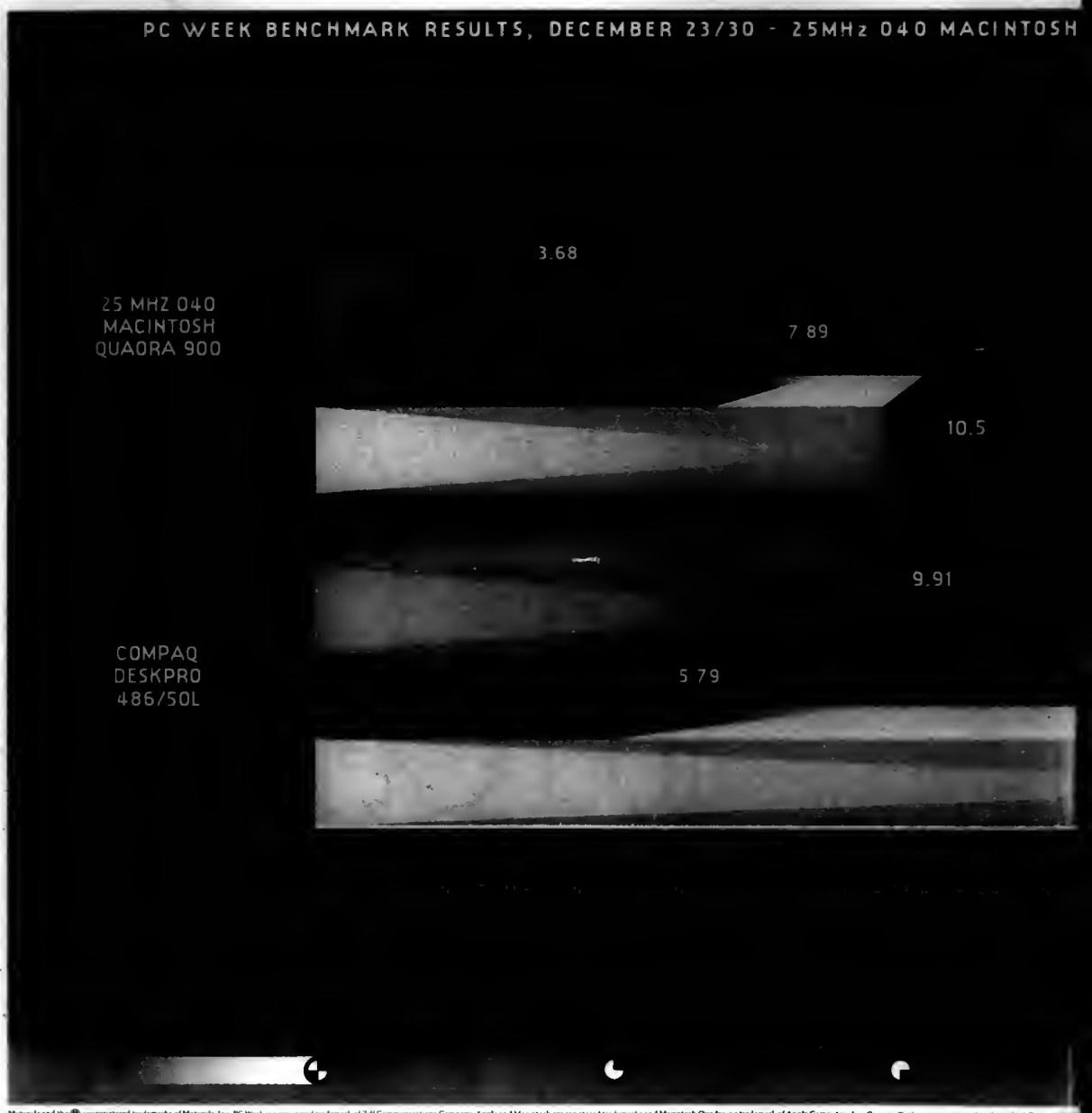

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PRODUCT SPOTLIGHT

VENDOR	PRODUCT	SCREEN SIZE (DIAGONAL INCHES)/RESOLUTION	HOST BOOTED FROM	PROCESSOR/GRAPHIC PROCESSOR TYPE	MINIMUM/MAXIMUM RAM SUPPORTED BY X TERMINAL (BYTES)	RAM REQUIRED BY X SERVER	VIDEO MEMORY (BYTES)	FLASH PROM	SYSTEM BOOTED	X11 RELEASE SUPPORTED	REMOTE PROTOCOLS SUPPORTED	FUNCTIONS LOCALLY RUN ON X TERMINAL	LOCAL WINDOW MANAGER	BIT PLANES SUPPORTED	NUMBER/TYPE OF INTERFACES SUPPORTED	PRICE
Sunflower Corp. (913) 838-8000	Xcel Series Model XL-12	Screen purchased separately/1,280 x 1,024	SCO Open Desktop, Interactive X11	TI 34010/34010	2M/4M	512K	1.5M	No	Download	R4	None	Font management	None	8	2 serial, 1 parallel	$1,999
	Xcel Series Model XL-10	Screen purchased separately/1,024 x 768	SCO Open Desktop, Interactive X11	TI 34010/34010	2M/4M	512K	1M	No	Download	R4	None	Font management	None	0	2 serial, 1 parallel	$1,549
	Xcel Series Model XL-8	Screen purchased separately/800 x 600	SCO Open Desktop, Interactive X11	TI 34010/34010	2M/4M	512K	1M	No	Download	R4	None	Font management	None	0	2 serial, 1 parallel	$1,299
Tandberg Data (011-47) 2-18-8080	TDU 6310F	14/1,024 x 768, 800 x 600	Sun, HP, DEC, IBM, DG	TI 34020/NP	5M/21M	1M	1M	Yes	Download, prom	R4	NP	Window management	Motif	0	2 serial	Contact vendor
	TDU 6330F	17/1,024 x 768	Sun, HP, DEC, IBM, DG	TI 34020/NP	5M/21M	1M	1M	Yes	Download, prom	R4	NP	Window management	Motif	0	2 serial	Contact vendor
Tektronix, Inc. (800) 225-8434	XP230 Series	17, 19/1,280 x 1,024, 1,152 x 900	Sun, HP, DEC, IBM, VMS, Unix	R3000/34020	5M/52M	3M	1M, 2M (depending on model)	No	Download, prom	R4	SLIP	Font management, window management	Motif	0	2 serial	$3,395 - $5,995, depending on model
	XP10 Series	15-19/1,024 x 768, 1,280 x 1,024, 1,152 x 900	Sun, HP, DEC, IBM, VMS, Unix	TI 34020/Vega	4M/12M	2M	1M	No	Download, prom	R4	Serial Xpress	Font management, window management	Motif	0	2 serial	$995 - $3,795, depending on model
Visual (508) 836-4400	TX800C	19/Up to 1,280 x 1,024	Sun, HP, DEC, IBM	68040/2 custom ASIC	4M/16M	Varies with local clients	2M	Yes	Download, flash	R5	SLIP	Font management, window management, color management	Motif, Open Look, tab window manager	0	2 serial	$3,495 base price
	TX900C	19/Up to 1,280 x 1,024	Sun, HP, DEC, IBM	68030 TI 34020/34020	6M/37M	Varies with local clients	2M	Yes	Download, flash	R4	SLIP	Font management, window management, color management	Motif, Open Look, tab window manager	8	2 serial	$2,995 base price includes software license

Tales from the land of X

Wrong number, wrong address

Even users with impeccable technology credentials can create minor disasters with X Window System terminals. Such was the case at the US West NewVector Group in Bellevue, Wash., where employees use X terminals from Applied Digital Data Systems running over a network to Sequent Computer Systems, Inc. computers. One of their main occupations is monitoring cellular phone switches.

For instance, if the tower light fails, says Bill Holt, manager of production for open systems administration, that information is passed over the wide-area network to the Sequent computer, which displays it on overhead screens. If multiple problems appear to be hitting at once, "the [tech staff] can bring up the window related to the specific city and iconize it off, so it's there if the problem occurs," Holt says.

But one day the system kept crashing. Since X terminals act like nodes on a network, Holt explains, each one has its own address. Users have to correctly input their own terminal's address and the address of the machine they're going to communicate with.

"We had a situation where the user reversed those numbers," Holt says. It was hours before the user reported a correlation between the crash and his attempt to access the system. "Very few X terminals offer protection of the basic setup configuration," Holt says.

The system *is described by US West's Holt as 'a miniature movie theater, and everyone has a full panoramic view'*

Please support me

"Know thy vendor" is a proverb that worked especially well for Henry Camp, president of Medical Systems Development Corp. (MSDC). His company selected X terminals two years ago for Atlanta-based Grady Memorial Hospital to run the Theresa medical software produced by MSDC.

The 400 X terminals were to be installed on an Ethernet LAN and run off DEC VAXs. The hospital decided to switch from dumb terminals because of the complexity of patient information that doctors need to evaluate.

Camp says it was critical to find a vendor committed to helping Grady resolve the technology concerns particular to a hospital. The chosen company was Westboro, Mass.-based Visual, which has fulfilled its share of special requests. When the hospital wanted to have the terminals print directly to local printers in 1989, Visual made it possible for printers to attach to the terminal's serial port and capture host data, instead of requiring separate wiring. And since the hospital also required bar-code readers, Visual adapted its readers to fit in the keyboard connection available on the terminal.

"I think a willingness to accommodate changes is extremely important for X terminal manufacturers compared to ASCII terminals," Camp says.

Getting your wires crossed

For Jim Honerkamp, selecting an X terminal for the brokers at McDonald & Company Securities, Inc. in Cincinnati was a no-brainer: At the time, only Network Computing offered a localized windowing manager, which helped limit the amount of network traffic.

The plan was for the brokers to make trades at their desks using the X terminals, as well as log on to a remote stock quote system. But once the terminals were selected, Honerkamp says, director of computer services at the Gradison Division, the company discovered that its existing wiring scheme wouldn't work.

"We had a four-pair wire, and we were using one side for phones and one side for dumb terminals," Honerkamp says. "That didn't work with X terminals because you couldn't have the phone signal running over the same physical wire."

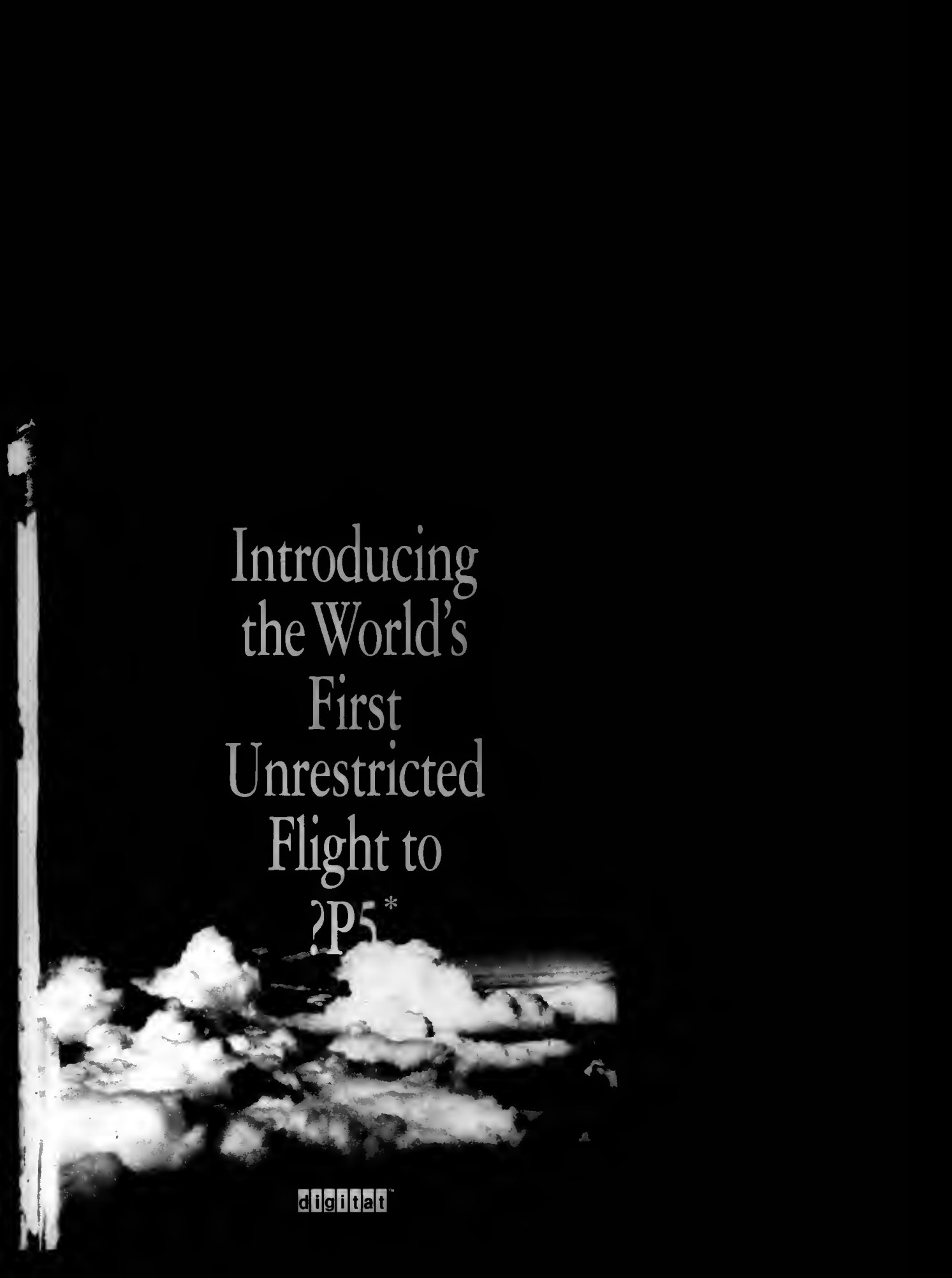
Fortunately, the company had also decided to install a one-way broadcast system conveying brokerage news through a speaker on each broker's desk. That system was hooked up through the telephone wire.

Then Honerkamp turned the X terminal wiring problem into an opportunity by trying a new technology: connecting the X terminals to the LAN via Motorola, Inc. Altair wireless LAN units.

Currently, ceiling-suspended "control modules" (connected to the LAN with twisted-pair wire) broadcast radio signals to "user modules" that are in turn connected to groups of X terminals with twisted-pair wire. "There's no wire between the user module and control module," Honerkamp says, "so it drastically minimizes the amount of wire that you have to pull."

"We're spread across two floors of a twin-tower building," he continues. "If I had 70 dead runs [of wire] from my computer room, I'd get into big bucks. Instead, we run about 10 and still drive 70 terminals."

All stories by Anita Amirrezvani, a freelance writer in Berkeley, Calif.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- O 20-35
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- O DOS with Windows
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Information access for all

What if TV sets cost a little more, computers almost nothing and everyone could tap into national databases containing anything in print?

BY DAVID H. ROTHMAN

Some high school students in Silver Spring, Md., have been working on an affordable virtual reality system for small business. While a finished system won't go on sale next week at Radio Shack, the students' work has been good enough for a top Army laboratory to hire one of them for the summer. Ten years from now, all three students might be cherished employees at Intel Corp., IBM or another high-tech company.

Gloria Seelman, a research coordinator at Montgomery Blair High School in Silver Spring, sees the ongoing project as an educational success. Students' brains and tenacity have helped. But so has something else. Via Dialog databases, students at the school can dial up many facts missing from the school library.

Without databases, Seelman says, the work done so far might have taken twice as long. As it happens, even the University of Maryland lacked perhaps half of the books helpful to the project, and interlibrary loans would have meant weeks of waiting. The databases, unfortunately, offered citations but not full texts of books.

Imagine how much the Blair students could have accomplished by now in their three-semester course in Independent Research if they could have downloaded whole books, if they had not been limited to the offerings of libraries nearby. Suppose that they could easily hook up with an electronic version of the whole Library of Congress. In fact, suppose that millions of other students, parents — anyone — could retrieve technical tomes, novels, articles — almost anything ever published. Suppose, too, that they could read the material on laptop computers that sold for $50 or, even better, were provided free of charge by the government.

Farfetched? No. For years, computer hackers and librarians have dreamed of being able to read any book on-line. And now technology has come far enough for this to happen in the next two decades, through a plan that I'll propose here. My TeleRead plan would promote literacy, increase general exposure to computer technology and aid our domestic high-tech industry.

Tim Clark

Under TeleRead, millions of Americans could dial up books from home via a giant computer network. The government would encourage Silicon Valley to turn out small, affordable computers with sharp American-made screens that you could read more easily than a book.

No, Washington wouldn't pay laptop makers for research and development. Rather, the government would use revenue from a 10% tax on television sets and other video products to buy laptops for schools and libraries, ensuring enough of a market to justify the R&D in the private sector.

Extrapolating from a Department of Commerce statistic on annual sales to consumers, such a tax might raise $2 billion a year. This tax needn't be burdensome. Let's say a television cost $350 and the owner kept it five years. He would pay a tax of $35, or 10%, when he bought the set; that would break down to just $7 annually, or about the price of a pizza.

A tax would hardly kill off television or double SAT scores, but it would send a message about new priorities for the country.

Some general tax revenue might augment the money from the "Tube Tax" if need be, but not necessarily forever. The TeleRead program could collect subscription fees, determined by family income, from people downloading books and other material from the network.

Spending spree

Just how would TeleRead spend its money at the start? One of the program's goals would be to develop an instant market for trailblazing U.S. companies in areas such as screens and memory chips. With massive procurement contracts, the government could hasten the coming of powerful, toaster-simple laptops selling for a tenth or twentieth of the cost of today's models. Right now such machines seem to be at least two decades off, if you want them to have sharp color screens.

TeleRead contracts would clearly favor computers with screens and other parts designed and manufactured in this country. Domestic companies couldn't avoid all foreign technology, of course. But the TeleRead program would nurture our R&D as much as possible, especially in crucial fields

Continued on page 78

Here's the plan

- **Use money from 10% sales tax on TVs to underwrite R&D by U.S. companies on notebook computers you can read like a book.**
- **Give these computers free to all schools and libraries, and make them available at a very low cost to everyone else.**
- **Develop national databases of new and existing published material.**
- **Create a national network to provide easy access to these information stores.**

Results: A boost for U.S. high tech; better educational opportunities for all citizens; and a more literate and technically proficient labor pool.

Rothman is author of *The Complete Laptop Computer Guide* (St. Martin's Press, New York) and other books on high tech.

Continued from page 77

such as laptop screens and memory. Simply put, the program would make high tech safer for our often skittish venture capitalists without setting up a massive research bureaucracy or resorting to an onerous tariff, such as the one that the Commerce Department slapped on some LCD screens.

Promotion of U.S. high technology, of course, would be just one of TeleRead's purposes. With money from the Tube Tax, the federal government could give away laptops to many schools and libraries and ultimately to bright students from low-income families.

Our schools need more computers. According to statistics published in the 1992 Computer Industry Almanac, U.S. public schools had one computer for every 20 students last year. What's more, programs for the gifted and talented enjoy a disproportionate share of the machines.

Corporations donate equipment in some districts, but the flow of gifts is too small and too haphazard to do much good nationwide.

Even in affluent areas, many schools are hanging on to Apple Computer, Inc.'s Apple IIs and other antiques and are wishing they could offer their students something better, according to Vicki Hancock, an educational technology expert at the Association for Supervision and Curriculum Development (ASCD) in Alexandria, Va.

Benefits on every level

TeleRead, of course, shouldn't just buy computers. It should also help pay for computer literacy instructors for students, teachers and librarians so the machines wouldn't sit around unused in closets. Everybody would master the basics of on-line searching, the high-tech equivalent of the Dewey decimal system. Teachers would learn how to dial up books and other material in their specialties to enrich their classes.

"This program would benefit average students as well as gifted ones, and it would better prepare Americans for work in an information-dependent society," says Hancock, editor of the "ASCD Curriculum/Technology Quarterly."

"Schools should teach everyone to find and analyze facts from many sources, not just regurgitate from textbooks," she says.

Jeremy Gordon, a just-graduated senior who worked on the Montgomery Blair project, agrees. "When I go to the public library," he says, "I see long lines of students in front of the CD-ROM magazine index. An on-line national database would be incredibly useful."

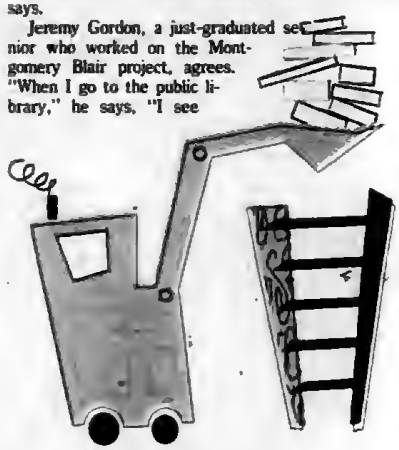
TRnet, part of the TeleRead program, would offer Gordon and his peers an electronic cornucopia. This national network would carry the full texts of all new books and other publications.

Operation phase in

The way this would come about is that the government would begin to require all material longer than 10,000 words to be in digital form in order to be copyrighted. The government would phase in this requirement gradually, perhaps with a voluntary program. Many authors and publishers would rush to take advantage of TRnet, seeing it as a new market; after all, most publishers today are already using computers to set type. As for undigitized material shorter than 10,000 words, scanners could pick up the images.

In all cases, TeleRead would pay fairly. If you wrote a book, for example, your earnings would depend on how often people dialed it up. Of course the network would not need to pay anyone for items already in the public domain — for example, government publications, statistics and old literary classics. So the basic TRnet service might be free or cost very little, even for nonstudents.

Mind you, TRnet would be just one option for readers. People could still buy books, either the old-fashioned kind or the electronic variety, from publishers or authors themselves. That would be one way to cope with the risk of censorship.



Using what we've got

A public network is an essential, however, if we want broad-based, affordable access to a wide selection of books and other material.

Some skeptics might call this plan socialistic, but it isn't — any more than a public library is.

If Andrew Carnegie, that 19th-century capitalist extraordinaire, were alive today, he would probably be funding demonstration projects, just as he helped small-town libraries across the U.S., hoping that ambitious Americans would use the technology of the day to better themselves and their earning potential. •

Yes, there is literature ready to be downloaded

Two decades ago, Michael Hart had a vision. Although most of the people he tried to describe it to thought the idea was crazy, Hart was convinced that someday, hundreds of millions of people would own computers and want to use them to access research books and great works of literature.

Since then, Hart, an adjunct professor at Illinois Benedictine College in Lisle, Ill., and a small army of volunteers across the country have transferred several dozen books, mostly classics such as *Alice in Wonderland* and the Bible, into electronic form for free distribution. His goal these days is 10,000 free on-line texts by the end of the year 2001. *Computerworld* assistant editor Kelly E. Dwyer recently spoke with Hart about this ambitious undertaking, which is called Project Gutenberg.

Q What is it that compelled you to make this project your life's work? What's your driving force?

A Our goal is for some reasonable fraction of the population to be able to get some reasonable fraction of the information that they want, without having to do any more than say, "Hey computer, have you got Aristotle's *Poetica* in here?" and it will say, "Bing! Here it is." If 75% of the people could get 75% of their questions answered, we'd feel a certain amount of success. It would be even better if 90% of the people could get 90% of their questions answered.

Whatever books people look things up in the most, that's what we want to publish. We'll eventually publish phone books, encyclopedias, the dictionary. We've got a thesaurus and an almanac already. If we knew exactly the 10,000 books that people wanted to look stuff up in the most, those are the ones we would do. It's purely utilitarian. People ask me why I do it, and the really big answer is, "Because it's there."

Q Why aren't hard-copy books that are free from libraries enough?

A When you go to the library, the books can be already checked out, they can be in for rebinding, they can be on the wrong shelf, they can have their pages torn out of them. You aren't supposed to write in them, you have to bring them back; if you don't bring them back on time, you have to pay a fine.

For me to get *Alice in Wonderland* off of one of our computers here takes me a local phone call, which costs a nickel; or, if I ride my bike over to the computer, it doesn't cost me anything. And if I get 20 books, it still only costs me a nickel for the phone call. And I can dial up and get *Alice in Wonderland* and never have to take it back.

The reason for electronic text instead of paper is it's cheap, universal — it can be translated into every computer language that's ever going to come op. Any computer you're going to find, you can run one of our books on.

Q Reading off a screen doesn't seem like the most comfortable or natural way to read a book.

A As people get screens that are more and more to their liking, it doesn't bother their eyes so much to read them on the screen. And eventually we'll have screens that look just like paper anyhow.

Q How many texts are currently on-line?

A We've got about 24 to 26 on our machine in particular. We don't have enough space to keep the old ones. Carnegie Mellon University has a collection of our stuff. I don't know, they've probably got 50 things that we did. We've got several different editions of the Bible . . . a couple different editions of *Paradise Lost*, *Aesop's Fables*, things like that.

I'm sure *Alice in Wonderland* is our most popular title. It was our flagship book for a long time. Anybody who wanted to experiment with Gutenberg, we just sent them *Alice in Wonderland*.

Q How many volunteers are now working with you on this project? Who are they?

A We've probably got in the low hundreds. And they're about evenly divided between the volunteers who help us do copyright searches and locate old editions that we can use and the people who actually enter the books themselves.

We've got everything from little old ladies in the middle of Vermont typing away at old Ataris and Apples to people who are full tenured professors. People from all over the world enter all the text. I get boxes in the mail with a book and a disk that say, "Here, I typed in this book; here's a the disk."

Q What are your goals? How many books would you like to see on-line? How many copies distributed? How many readers?

A I expect 100 million readers by the end of 2001. The basic home library is going to be 10,000 books. Our goal by the end of the year 2001 is for people to be able to store our entire library of 10,000 books for $100.

I am seriously predicting that it will cost a penny to store the average book on a floppy by the end of the year 2001. Right now it costs a nickel to store something like *Alice in Wonderland* on a 1.44M-byte floppy.

Q How do you currently distribute the texts? Do you foresee using other distribution means down the road?

A We mail disks around to people who can't get on the Internet, bulletin boards post our texts for people that don't have any network connections and others will just call up on the phone and get them. A lot of it's just hand-to-hand. There'a a Bitnet connection besides an Internet connection.

Internet is still the easiest way, in my opinion, because you can use FTP. And with FTP, even with a really slow connection — where you're getting 5K bytes per second — that's still only 30 seconds to get *Alice in Wonderland*. You couldn't possibly walk down to the library and get it as fast as you could dial up. •

The TeleReader circa the year 2012

It's the year 2012. TeleReader designs have evolved slowly over the years. Washington did not just ask for bids and then settle on a permanent design. Instead, it has awarded contracts in steps.

The first machines cost a great deal and were far less powerful than the model you own today. But they did encourage the use of TRnet, which the government started as soon as possible to get publishers to digitize their offerings. Here's what the TeleReader looks like and what it can do after 20 years of evolution:

Form

The machine comes with two detachable parts. The first is a keyboard with a built-in trackball. The keyboard is big enough for typing but small enough to carry around comfortably, and it can even fold up.

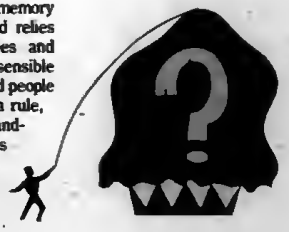
The second part is a thin, lightweight, detachable screen that contains the CPU and memory chips, which are the true guts of the computer, as well as a tiny loudspeaker.

The screen measures 12 in. — small enough to be compact, but large enough to be read comfortably. You do not see even the slightest flicker. Also, the screen uses vivid color to help hold your attention, and it can offer charts and drawings in detail.

Functions

- **Access.** You fetch books and articles via phone wires or cellular radio. Throughput at the start of the TeleRead project was as high as 38.4K bit/sec. and now, after 20 years, can exceed 1M bit/sec. in many cases, Superfast speeds are possible even without fiber-optic wiring in homes, schools and libraries if telephone companies update their switching equipment.
- **Search.** You can use the trackball to work your way through a Macintosh-like menu. Your screen shows that you have millions of choices from books, newspapers, magazines and professional journals. But not to worry. You needn't structure your queries much at all. TRnet uses artificial intelligence to help you zoom in on your exact topic.
- **Knowledge collection and perusal.** You can read directly from the screen, open up another window and take notes or use the built-in speaker to listen to audio material (such as a speech you are reading). You can prop up your TeleReader screen on a table using a built-in stand, place the keyboard on your desk for extended work sessions or detach the screen for comfortable reading.
- **Knowledge retention.** The TeleReader stores at least a gigabyte of data, the equivalent of about 500,000 double-spaced, typewritten pages. You can hold thousands of books, and if you want to exchange data with friends, you can plug in memory cards. Because TeleRead relies on flat subscription fees and reaches a huge market, sensible authors do not really mind people sharing their books. As a rule, writers get paid more handsomely than when readers spent so much money on cardboard, paper and ink.

DAVID H. ROTHMAN



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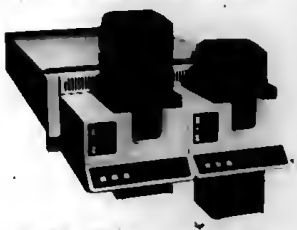

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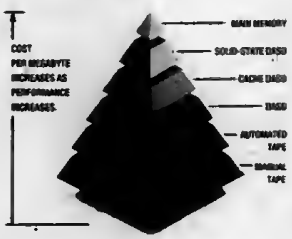

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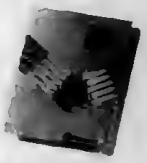

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MANAGER'S JOURNAL

EXECUTIVE TRACK

Elise J. Ross has been promoted to the post of corporate vice president at **The New York Times**. In her new position, Ross, 48, will be responsible for all information systems and communications for the newspaper company's information and publishing systems, including the development of IS and new technology strategies. Ross formerly served as vice president of systems and technology at the paper.

Campbell Travel is making **Money**: In fact, the Dallas-based corporate travel management firm is making him an IS consultant. **Denny Money**, formerly operations manager at food flavoring manufacturer The Van Tone Co., came aboard at Campbell earlier this year to help supply the firm with a competitive distinction by way of technology-driven, individual tailored customer services.

Cherri Musser is the new manager of the IS strategic business unit at **Texas Instruments, Inc.**'s Enterprise Systems Business. Musser, who joined TI in 1973 as a business applications programmer/analyst and has risen steadily through the IS ranks, takes on the IS stewardship of a unit focused on four areas of application development software: procurement, order processing, customer management and electronic data interchange. She is responsible for internal TI's Corporate Business Systems, comprising marketing, logistics, control and administration.

There's a new hand on DEC at **Computer Methods Corp.** The Livonia, Mich.-based software and consulting firm last week announced that **Ernest Ritterhaus** is its new divisional manager in charge of an operations group focused on consulting with the firm's Digital Equipment Corp.-based clients. A 14-year computer industry veteran, Ritterhaus most recently founded a software firm, Devenir Corp.

Imaging: It's a jungle in there

IS directors blazing trails in imaging are wise to learn from others' mistakes

BY NELL MARGOLIS
CW STAFF

J.P. King

Whoever said "What you don't know won't hurt you" never tried to implement a large-scale imaging project.

To the contrary, say information systems directors who have navigated the perils of the huge projects that are emerging as cornerstones of corporate re-engineering efforts at banks, insurance firms and other large companies: The first and perhaps worst mistake IS directors can make is to hare down the imaging trail kidding themselves that they're on familiar territory.

"Imaging as a pure technology has been around for a good while, so people tend to think they know their way around it," says George Hewlett, corporate vice president at New York Life Insurance Co. But they don't, Hewlett and others who have been there say.

Bungalow blues

New York Life recently whittled down to manageable size a plan to put virtually its entire business on an imaging platform; the company is striving toward its ambitious goal one finite business process at a time. "Nobody has died over this," Hewlett says, "but that doesn't mean the IS people in charge aren't taking a lot of antacid tablets."

The U.S. Patent Office so underestimated the technical complexities and time requirements of an early image-based automated patenting process that the schedule was pushed back three years, Assistant IS Commissioner Thomas Giammo said. The cost to the patent office? Time, money "and at least one career," says Wick Keating, vice president at Arlington, Va.-based systems integration firm American Management Systems, Inc., which was called in to consult on the project.

Second thoughts rarely come cheap on imaging turf, where "the average significant project starts out in the $1 million to $2 million range, and the sky is the limit," Keating notes.

But while there is no guaranteed safe route through the deceptively virgin territory, canny IS leaders can hedge their bets by heeding the cautionary tales that are filtering back from early explorers.

For starters, Hewlett says, "There's a need to recognize that the power curve for document imaging is simply not the same as it is for item processing." Not only does the bit count surge, he says, but the parameters change. "The forms aren't the same size. Suddenly, you're dealing with myriad colors, shapes, sizes, paper weights — and with myriad complexities, especially associated with indexing and recognition."

While the power demands are likely to exceed your expectations, the compatibility of the various hardware and software components lashed together into an imaging system are likely to fall short, warns Frederick Bauer, senior systems project administrator at Baltimore Gas & Electric Co. (BG&E). "Be wary of the word 'Open,'" he says. "Every vendor out there professes to have open systems, but when you get down to the nitty-gritty, they don't talk to each other."

Stumbling blocks

As part of a five-year re-engineering plan kicked off about 2½ years ago, BG&E recently committed to image some 200,000 pages of technical, procedural and business textual information critical to the operation of its Calvert Cliffs, Md., nuclear plant. Phase II, which will load drawings into the system, is next.

The Calvert Cliffs project stalled midstream, Bauer says, when emulation software selected partly on the basis of its alleged openness balked at communicating with the plant's extensive Novell, Inc. network. While bridging the communication gap did not add dollars to the utility's contract price, Bauer says, "it held up production for about three months. We knew going in that we'd probably run into some

Continued on page 83

When the going gets tough . . .

In imaging, as in all re-engineering activities, the thorniest problems are cultural rather than technological. As veteran management consultant Michael Hammer says, "The soft issues are the hard issues." And two of the hardest, IS heads agree, are the work-force cuts often triggered by work-process improvements and finger-pointing that can start when the virtually inevitable imaging project snafus set in.

A raft of imaging pioneers offer two rules of thumb: When it comes to staff cuts, act quickly, decisively and with constant communication; when it comes to blame, don't act at all. "If you don't reduce work force, you don't get the efficiencies that the new way of working was planned to attain," management consultant Rex M. Scott notes. "But you've got to be careful to do it in a way that leaves [the layoff survivors] excited and not preoccupied with fear for their jobs."

Scott had to walk that narrow line recently when, as director of operations and chief financial officer at Rocky Mount, N.C.-based Unity Bank & Trust Co., he helped spearhead the $140 million bank's installation of a check processing imaging system. "We told our employees what we were doing early, we told them why, and we told them everything at once," he said. "That helps."

Reticence, even undertaken with the best diplomatic intentions, can go hideously awry, American Management Systems' Wick Keating added: "One company whose name I can't reveal geared up an imaging team and didn't tell them that the goal of the project they were working on was a 40% reduction of their own ranks." The news leaked anyway, Keating said. "You can just imagine how hard everyone was working to make sure the project got implemented," he added.

NELL MARGOLIS

Chase cuts over to Metrotech

New York bank consolidates three IS facilities into single Brooklyn site

BY THOMAS HOFFMAN
CW STAFF

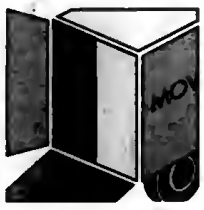
NEW YORK — A data center grows in Brooklyn.

In an effort to save money on prime Manhattan real estate and to consolidate its back-office operations, Chase Manhattan Bank NA is in the midst of a $500 million consolidation project.

The $97 billion bank is currently moving the bulk of its back-office data center operations — such as domestic and international money transfer and check processing — from two sites in Manhattan and one on Long Island to a new facility in Brooklyn. By September, the bank said, the facility will house 7,000 Chase employees.

The new facility is called Metrotech. It's the brainchild of New York City officials who are desperate to keep the remainder of large New York-based businesses from moving their operations out of the city to areas in which real estate is less expensive. The Security Industries Automation Corp. is also in the process of moving into the Metrotech site.

Consolidation is nothing new to Chase, the nation's fifth-largest bank (ranked by assets). Chase's parent company, Chase Manhattan Corp., has consolidated 100 data centers to 58 sites during the past two years, according to a report issued earlier this year by Salomon Brothers, Inc.



The report said the consolidations have saved Chase $29 million annually, with further consolidations, such as Metrotech, expected to double those savings within two years.

Chase executives declined to project cost savings for the consolidation efforts related to Metrotech. However, Anthony Minko, vice president of telecommunications at Chase and the Metrotech telecom site manager, said the firm expects major productivity gains to result from the new networking equipment being installed.

Chase's Metrotech environment will consist of 62 16M-bit IBM Token Ring local-area networks with an Ethernet backbone. At the heart of Metrotech is AT&T's Systemax PDS, a complex yet flexible wiring hub that supports all of Chase's voice and data communications.

Jerry Cafaro, AT&T support manager for the Chase project, said the Systemax PDS installation at Metrotech is AT&T's largest to date. Minko said the AT&T Systemax PDS will provide Chase with a common link among its mainframes throughout the world.

To date, the bank has installed one IBM Enterprise System/9000 Model 900 mainframe and has funding for one more this year and space for three more mainframes in the future. Chase is also installing a Unisys Corp. 2200/900 mainframe to support check processing, several hundred Digital Equipment Corp. VAX minicomputers and several Storage Technology Corp. ACS 4400 automated tape library subsystems.

Over Memorial Day weekend, Chase was scheduled to move its data center from New York Plaza in Manhattan to Metrotech. Uni-Data and Communications, Inc., a Flushing, N.Y., systems integrator, has been contracted to install Chase's hardware in Metrotech during a one-year migration.

According to Daniel G. Hoffman, vice president of sales and marketing at Uni-Data, Chase's equipment at Metrotech will mirror current Chase technology at the bank's offices in Manhattan and at its Lake Success, N.Y., data center.

The command center is expected to be production-ready by September. Additional equipment to support the command center will be installed in August. Minko said the facility is configured to eventually support up to 11,800 workstation users.

Minko noted that Chase considered moving these operations to New Jersey until four years ago but was persuaded by city officials to remain in New York. "Besides, Chase has been in New York for 200 years," he added.

TI launches program for IS personnel

DALLAS — Amid ever-increasing demand for improved information systems support staff, Texas Instruments, Inc. is making a move on the supply side.

TI's Employee Development Center, launched in April, is a pilot program aimed at making sure that IS personnel get all the career training and advising they can soak up — and, importantly, that they get a good deal of it from their department and division managers.

Under a senior adviser program that is a formal part of the pilot, managers turn mentor, advising staff members on topics likely to clear and widen career paths, Development Center head Sue Hensley said.

While actual senior advisory meetings are held in confidence, Hensley said, typical discussions "include progress vs. self-expectation, technical resources available, technical trends, organizational cultures, policy and procedures and training recommendations."

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Imaging: It's a jungle in there

CONTINUED FROM PAGE 81

problems, but we didn't know it would take this long."

In fact, Bauer adds, the utilities are drawing an ironic moral from watching one another's trials and errors in the imaging arena: "Those that have a network already are at a disadvantage."

The First National Bank of Chicago, an early adopter of imaging for both check processing and commercial documents, learned the hard way that processing images puts unique demands on an existing computer infrastructure.

"We first tried to put documentation on the mainframe using an early version of IBM's [ImagePlus] system," says Gamil Sakla, assistant vice president at the bank. "But it clobbered the CICS system," he adds. "You can't mix transaction processing and imaging."

Tough advice though it is, imaging pioneers widely agree that the best guide to implementing a major imaging project may be that which you learn from your own early mistakes. Vicarious experience is a less expensive and harrowing alternative — help yourself to a heaping portion, IS leaders recommend:

- "The criticality of an up-front feasibility study cannot be stressed enough," says Mark Olson, deputy vice president of student financial and information systems at Columbia University in New York, now shepherding the sprawling 15-college university through an effort to put some 70,000 financial forms into an imaging system expected to be up and running by Christmas. Columbia spent eight months on vendor selection alone.
- And don't short training and staffing requirements as you draw your blueprint, Olson adds: Many have, and many have paid.
- "Interview some of your vendors' other customers," Bauer says. And kick the tires, early and often. "I would insist on an on-site demo of every piece of equipment you buy," he says. "Make the vendors prove not just that it works, but that it works in your context, to the requirements of your plan."
- Make sure your first attempt is finite and noncritical, Hewlett cautions. No one at your company will thank you for having a learning experience on mission-critical turf or time.

Above all, Hewlett and others say, be mindful at all times of the fact that imaging is not an evolutionary technology so much as it is a revolutionary corporate cultural change. "Don't expect to get rid of paper early in the game," Hewlett says. "That won't happen. It can't. The biggest question we still get asked by people working with our new imaging system is, 'When can we print it?' "

Midwest bureau chief Ellis Booker contributed to this story.

Why ask why?

Don't assume you need a professional systems integration firm to see you through an imaging attempt, says Frederick Bauer, senior systems project administrator at Baltimore Gas & Electric. And don't assume you don't, either.

"This is a highly individual decision," Bauer says. "If you're modeling on another firm's experience, don't ask whether they used an integrator. Ask *why*." BG&E, for instance, partnered with American Management Systems on the first phase of the Calvert Cliffs project. For Phase II, Bauer says, the firm plans to leverage its Phase I experience and proceed ahead without outside integration aid.

If your own business goals and IS capability in fact lead you to reach for an ally, notes Mark Olson, deputy vice president of student financial and information systems at Columbia University, don't run right to a professional services firm. "See what [your imaging hardware and software vendors] have to offer by way of systems integration services," he says. Vendors are scrambling to establish themselves as ace service providers and might do a lot to add you to their success stories. What's more, Olson says, they made your equipment, so they know where the bones are buried — and where the potential lies.

NELL MARGOLIS

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COMPUTER CAREERS

No rest for the weary? Time off doesn't always equal vacation

BY JILL VITIELLO
SPECIAL TO CW

It's July 6. Have you planned your summer vacation yet? If not, you might want to consider taking off a full week or even two. Really, the boss insists.

Many forward-thinking information systems managers are starting to see the health and corporate benefits of well-rested, well-balanced employees.

"Time off is an important part of our attitude about a healthy work style," says Nick Barth, president of Armor Systems, Inc. in Maitland, Fla.

This attitude comes as a change for a work culture that for many years prided itself on long hours, bleary eyes and stacked-up vacation time.

"As a general rule, computer people like to work, but overwork is detrimental to your health," says Harold A. Sample, data processing manager at Amerada Hess Corp. in Jackson, Miss. "We've all seen those walking zombies who never take their vacation time."

Some companies permit employees to store up unused vacation time from one year and carry it over to the next, thereby building up allowable days off. However, many IS managers now frown on that practice and encourage time off when time is due. "Our employees work hard and need to take their vacations when due," Barth says.

This change in attitude has a lot to do with the new pressures implicit in the job. IS has always been an intense environment, but today that's more true than ever.

"As a rule, IS jobs are high-stress," says Richard Wonder, president of the New York/New Jersey region of Robert Half International, Inc. in New York. "Add to that the fact that recessionary times put additional pressures on IS professionals, and it's not hard to see why IS employees really need to take several consecutive vacation days."

The trend toward shrinking IS departments, too, has forced many IS professionals to feel they need to take on extra tasks and work even longer hours.

Although just about everyone acknowledges the benefits of vacation time, it's tough to get IS professionals to truly take a break.

In fact, the trend for many IS people today is to skip out for a couple of days, not a whole week.

These people favor shorter, more frequent breaks, saying it gives them time with their families without making them fall behind at the office, Wonder says.

"Some families are so busy they hardly ever see each other unless they pack up their bags and head off together. They look forward to and cherish these times together," says Peter W. Mason, a travel marketing expert affiliated with the Travel and Tourism Research Association.

Others, like Sharoo Moses, systems manager at Plochman, Inc. in Chicago, are tacking vacation days onto business trips, thereby saving themselves airfare. Moses recently visited family members in California after a business trip there.

In fact, spending time with family is the No. 1 reason people give for wanting to take time away from the office.

Have PC, will travel

However, many IS workers admit that the work doesn't stop even while they are away from the office. "Actually, IS people can do a lot of our problem-solving work in our heads. Even when we're relaxing, our minds are working," Sample says.

Ironically, the very people who enable others to tote their offices anywhere — IS employees — are the same people who never get a break from the office. In addition, because offices are so portable, the lines of distinction between work and leisure have blurred.

Most who are out of the office for even a few days will check their voice mail and electronic mail. They leave phone numbers where they can be reached in emergencies, and they solve problems or handle users' questions over the telephone or with remote dial-up access from their laptops to the company's computers.

"With my computer, modem and fax, I can literally take my office with me on vacation," says James E. Bell, director of IS at the Colonial Williamsburg Foundation in Williamsburg, Va.

Most everyone agrees that interruptions are inevitable; they simply come with the territory.

Of course, not all IS professionals stay accessible while away from the office. For example, many at Atlantic Electric Co. in Pleasantville, N.J., choose true getaways such as fishing trips, says Michael G. Barnes, director of technical services.

However you opt to do it, taking time away from the routine of daily pressures improves job performance in the long run.

"We all need a break in the action," says Alan Mis, director of IS at American Steamship Co. in Buffalo, N.Y. "After a vacation, people return to work refreshed, with new ideas and increased energy."

Sound good? Then what are you waiting for?

Vitiello is a speech writer and freelance writer based in East Brunswick, N.J.

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INDUSTRY CURRENTS

Mail-order firms deliver great package

BY EMILY LEINFUSS
SPECIAL TO CW

They swim in an Olympic-size pool at lunchtime, play tennis after work and buy clothes at 40% off. No, they're not fashion models; they're the well-treated information systems employees at Lands' End Corp. in Dodgeville, Wis.

Lands' End, which houses a $6 million fitness facility on its grounds, is not the only mail-order catalog company to offer such perks. Mail-order firms — mostly family-run operations — are famous for their training policies, loyalty to their employees and, most recently, investments in technology.

"Mail-order companies are offering some exciting and innovative technical challenges, good work environments and a fair amount of investment in technology because the business relies so heavily on order processing and data collection," says Beverly Lieberman, president of executive search firm Halbrecht/Lieberman Associates in Stamford, Conn.

The name of the game in mail order is quality merchandise at low cost, which makes low margins an absolute necessity. "The only way to do that is by automating every aspect of the business," says Richard Davis, vice president of MIS at Popular Club Plan in Garfield, N.J. "Mail order lives and breathes DP," he says, adding that the industry is starting to realize that "it couldn't survive without it."

That was not always the case. The family-run origins of mail order kept innovative technology to a minimum, and the industry is now playing a game of catch-up with more sophisticated, highly automated industries.

Booming business is also putting the heat on for more efficient ways to keep up with orders.

To that end, many companies — including Spiegel, Inc. in Westmont, Ill. — are moving to client/server architectures with relational databases and distributed platforms.

Just-in-time inventory practices through electronic data interchange are also growing popular, says Nick Iozzo, technical services manager at Spiegel.

Most firms do not use much packaged software, so there are also lots of opportunities to design and write large application systems from soup to nuts.

Inexperience welcome

But what makes mail order stand out from other industries — such as insurance and banking, for example — is that the inexperienced need not shy away from applying.

"To get into [banking], you have to have all the credentials already," Iozzo says. "Mail-order companies allow you to grow. We offer all kinds of training. When you get in on the ground floor, you are allowed to experiment — even to make mistakes."

Iozzo gained invaluable technical savvy putting together a local-area network-based desktop publishing system for Spiegel's catalog production.

Mark Norman, a personal computer analyst at Lillian Vernon Corp. in Mount Vernon, N.Y., had a similar experience.

Norman says he probably would not have been able to learn about the LAN environment were it not for a recent project in which he was given full responsibility for developing and implementing a LAN and a distributed database.

Different backgrounds

In addition to getting good training, people don't necessarily have to have a strong technical background to get into IS in this industry. "Mail-order companies put the emphasis on quality people and are not averse to hiring hybrids — people who have a combination of technical skills and solid business know-how," says Chick Bisberg, president of Two-Party Systems, Inc., a recruitment firm in Livingston, N.J.

Even if you come in with just the technical experience, you're bound to pick up on the business side. The nature of mail order forces IS people to become less specialized and gain a more broad-based understanding of the business.

Frank Buettner, director of computer services at Lands' End, says he had no idea of the "big picture" when he worked in the insurance industry earlier in his career. But at Lands' End, Buettner has been involved with multiple areas of the business, developing inventory, purchasing, forecasting, marketing and decision support systems. "Now I understand the intricacies of each and that every department must work together," he adds.

Buettner says he likes to look at all the departments as a whole and wants to get involved in corporate strategic planning. He feels he can realize this goal because Lands' End likes to hire and promote from within, and he has seen technical people move into general business areas at the firm.

Not all need apply

But there isn't room for everyone who might like to take advantage of the mail-order environment. While the overall industry is healthy — which bodes well for IS disciplines and careers — it does not offer the sheer volume of employment of larger industries such as financial services or insurance, Bisberg says.

Secondly, the opportunities are best for entry- or lower level programmers, designers, and systems analysts.

The trick to a career in mail order is to get in on the ground floor or at the programming or system design level because the general thrust in the industry is to emphasize training and hiring from within.

"We mainly hire entry-level people and train them. Occasionally we go outside and hire for certain experience when we need it," says Jim Holly, manager of systems and programming at Peoria, Ill.-based Foster & Gallagher, Inc., a firm that owns a number of mail-order concerns.

Lemfuss is a free-lance writer based in Sarasota, Fla.

Stamp of approval

None of the hiring managers interviewed say they look for directly related experience when hiring in the mail-order industry. When hiring for jobs such as application programmer and project leader, broad business skills are a plus, and mail-order experience is not usually a requirement, says Richard Davis, president of MIS at Popular Club Plan.

For example, when Davis puts an ad in the paper or uses an agency, he never asks for prior mail-order experience. "I look for whether they have inventory control experience, accounts receivable experience, customer service experience," he says.

Nick Iozzo, technical services manager at Spiegel, says he looks for people with technical skills and a good business sense. "You have to have some business sense to interpret what users want," he says.

EMILY LEINFUSS

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NEW YORK: Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662, Valerie Galbo, 201-587-0090.

WASHINGTON, D.C.: 8304 Professional Hill Drive, Fairfax, VA 22031, Katie Kress, 703-573-4115.

CHICAGO: 10400 West Higgins Road, Suite 300, Rosemont, IL 60018, Patricia Powers, 708-827-4433.

LOS ANGELES: 18008 Sky Park Circle, Suite 145, Irvine, CA 92714, Barbara Murphy, 714-250-0164

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Computerworld/Corptech Career Index

Technology manufacturers may be experiencing a slight downturn in 1992, but they are still way in front of all other manufacturers

June 1992

Corptech technology employment index

U.S. Dept. of Labor manufacturing statistics

1989 = 100

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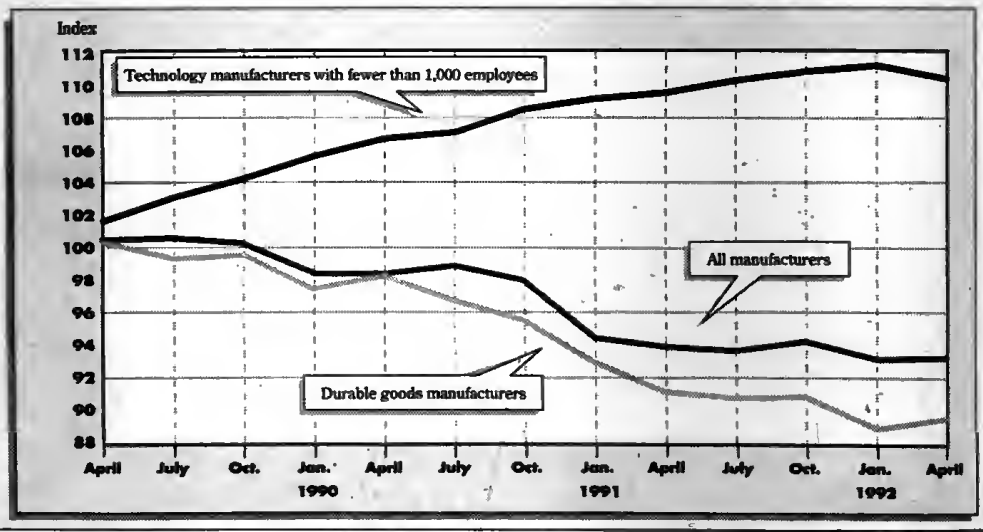

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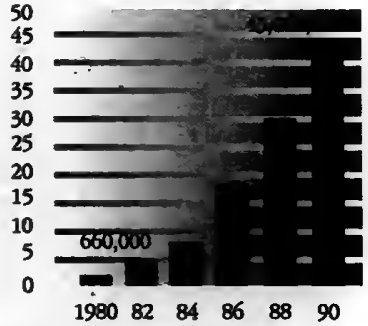
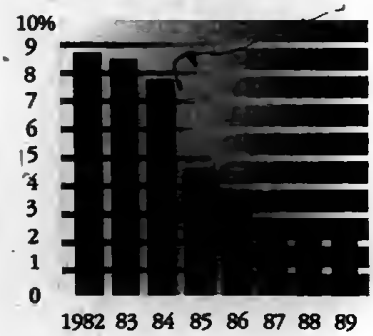


Fewer campus freshman are choosing computer careers**



Only 20% of computer professionals actively seek jobs through sources like local classifieds. **Free reports!**

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Skill/Product	Product type	Experts in Computerworld's Audience
IBM PC compatible	hardware	523,573
IBM (all but PC)	hardware	488,965
Digital Equip. Corp.	hardware	214,375
MVS	operating system	257,248
Cobol	language/utility	443,166

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Sources: *International Data Corporation **American Council on Education

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Computer Manufacturer	109,518
large-scale computers	52,213
medium-scale computers	67,325
small-scale computers	46,945
personal computers	73,925
technical workstations	30,943
Software Vendor	160,264
for large-scale systems	71,152
for medium-scale systems	81,799
for small-scale systems	72,212
for personal computers	66,366
for technical workstations	26,022
Non-CPU Computer Products Manufacturer	34,311
VAR/Dealer/Retailer	44,773
DP Service Bureau/ Contract DP Services	52,375
Consulting/Planning	112,149
Manufacturer (not computers)	229,608
Insurance	62,539
Healthcare	57,788
Banking/Financial Services	123,348
Government Federal/State/Local	107,915
Business Service (except DP)	35,940
Communications Systems	30,264
Public Utilities	43,687
Transportation	49,151
Wholesale/Retail Trade	82,674
Education	91,073

SOURCE: Skill Survey of Computerworld's Audience, June 1991

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RDBs	ORACLE, SYBASE, INFORMIX, INGRES, UNIFACE, PARADOX, FOXPRO, DataModeling
Unix/C	All Platforms, CASE TOOLS
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"Every year, Hughes recruits somewhere between 250 and 300 new graduates. The mainstream of our hiring centers around students with engineering backgrounds. Generally about 75% of our student recruits are in the electrical, mechanical, and computer engineering fields. Another 20% or so have scientific backgrounds, primarily in computer science and physics. The balance of our recruiting, then, is for MBA graduates with strong orientation in MIS or CIS. With one advertisement in *Computerworld's Campus Edition,* we get unique reach to all three of our student audiences.

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"In addition to delivering advertising results, the issue's Annual Student Survey serves as an important research tool. Upon receiving data on how students typically view Hughes Aircraft, we felt we needed to strengthen our image in this area. For continued success in recruiting top technical talent, we find feedback like this invaluable.

"To be effective, it's essential that our recruitment advertisement appears in a quality publication that students will read. We know *Computerworld's Campus Edition,* with its meaningful content, will have a long shelf life. Clearly, it's a publication that students will take back to their rooms pass along to fellow students, and keep for future reference. That means our advertisement in *Computerworld's Campus Edition* keeps right on working long after the issue date.

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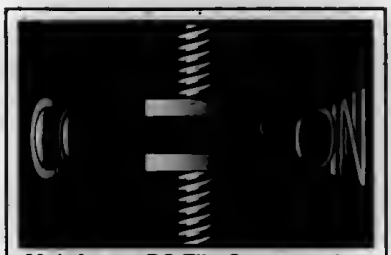

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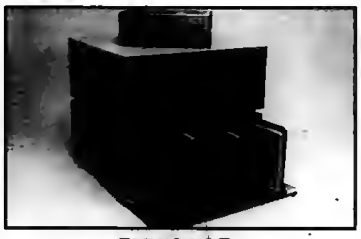

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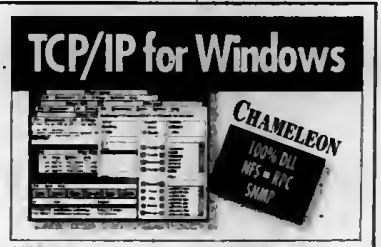

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MARKETPLACE

PC project managers pack punch

BY DANIEL J. LYONS
SPECIAL TO CW

The huge success of Microsoft Corp.'s Windows has sparked new interest in personal computer-based project management packages.

In the past, these PC programs were too cumbersome and complicated for many mainstream users. But thanks to snazzy Windows interfaces, a wider audience is emerging.

In 1991, the market for low-end project management programs priced under $1,500 grew 40%, according to Mary Conti Loffredo, a senior analyst at International Data Corp., a Framingham, Mass.-based market research firm. Sales of high-end products, she says, shrank 15%.

The reason: Many traditional high-end features are now showing up on the easier to use, less expensive PC products. For example, most PC project managers priced between $600 and $900 can now handle several thousand activities per project making them as powerful as products costing several thousand dollars.

Computer Associates International, Inc. in Islandia, N.Y., ported CA-SuperProject 2.0 to Windows late last year. The $895 package costs more than rival Microsoft's Project for Windows ($695) and Time Line ($699) from Symantec Corp. in Cupertino, Calif.

But, according to analysts, the CA package is more powerful, offering multilevel security, a variable use-over-time function and tight links to midrange and mainframe-based platforms.

Vendors are also focusing on making products easier to use. Microsoft's Project for Windows 3.0, for example, offers a feature called Planning Wizards, which guide a user interactively through a variety of scenarios. CA-SuperProject 2.0 has a Beginner Mode for simple jobs and an Advanced Planning Mode for more complicated work.

Other advanced features now found in PC packages include flexible reporting, high-quality graphic output, cost-tracking and sophisticated resource management capabilities.

However, despite the trend toward ease of use, consultants say project management packages are still far from simple.

"Everyone's buying scheduling tools even though they have no idea of how to do things," says Gopal Kapur, president of The Center for Project Management, a consulting and software development firm in San Ramon, Calif. "Then they blame the scheduling tool for not doing the job for them."

Kapur and others agree that it's wise to get users classroom training or help from experienced trainers or consultants.

Critics also warn that even though low-end programs theoretically can handle heavy loads, they can be unbearably slow.

What to look for:

- Maximum activities per project.
- Learning curve.
- Network/multiuser support.
- Integration with other applications.
- Chart types available.
- Environments supported.
- Scheduling increments.
- Resource management facilities.
- Cost tracking.
- Reporting and communication features.

Shopping list

Consultants offer the following tips for buyers of project management software:

• **Match software to the job.** In construction projects, for instance, simple resource management facilities will suffice. In contrast, a software development project needs to factor in the skills of individuals, so resource management is a must.

• **Don't forget existing environments.** A company that uses, say, Microsoft's Word and Excel, might do best to choose Project for Windows, which has tight ties to those products. But if a company needs to move data between multiple platforms such as minicomputers and PCs, CA-SuperProject, which runs on DOS, Windows and Digital Equipment Corp. VAXs, may be a better choice.

• **Don't buy too much power.** Consultants warn that using a product like Open Plan 4.0 from Welcom Technology, Inc. in Houston for the average business application is like using a cannon to shoot pigeons. Depending on the platform, this package can cost as much as $180,000.

"If I were a general contractor and had lots of subcontractors and lots of accounting for time, then I could see using a higher end package," says Bob Carlson, senior staff member at MCI Telecommunications in Sacramento, Calif. "But for little ad hoc projects, you don't need them."

Carlson recently acquired Protracs Professional 2.0 ($89.95) from Applied Microsystems, Inc. in Atlanta. "Sure there are things that it can't do," he says. "But I don't know what they are, and I don't care."

Lyons is an Ann Arbor, Mich.-based free-lance writer.

Four can be better than one

With more people doing project management, some firms find it makes sense to use several packages. Sverdrup Corp., an architectural, engineering and construction firm in St. Louis, uses four packages. The reason, says Bill Woloch, a project manager in the firm's Falls Church, Va., office, is simple: Different projects require different tools.

For instance, Sverdrup uses Micro-Frame Program Manager, an $11,000 program from Micro-Frame Technologies, Inc. in Ontario, Calif., in the company's corporate reporting system. For big projects, such as construction of baseball stadiums, Sverdrup uses Primavera Project Planner, a $4,000 package from Primavera Systems, Inc. in Bala Cynwyd, Pa.

For smaller jobs, Sverdrup turns to Symantec's Time Line, which Woloch says is much easier to use, and management uses Symantec's On Target ($399). "Primavera is very powerful, but it's a complicated program, and there's a steep learning curve. So you try to use it only when you have to. It's like the Thompson submachine gun of project management. If you can do the job with a .22, why use the Thompson?"

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The BoCoEx index on used computers
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PS/2 Model 35SX	$1,325	$1,500	$800
PS/2 Model 55SX	$1,000	$1,300	$800
PS/2 Model 60	$800	$900	$325
PS/2 Model P70	$2,300	$3,000	$1,500
PS/2 Model 80	$1,600	$1,800	$1,100
PS/2 Model 95	$4,800	$5,000	$4,000
Compaq Portable II	$425	$500	$375
Portable III	$550	$650	$250
Portable 386	$1,300	$1,800	$1,000
SLT-286	$700	$900	$400
LTE-286	$850	$1,000	$500
Deskpro 286E	$500	$1,000	$325
Deskpro 386/33	$2,000	$2,450	$2,200
Apple Macintosh Classic	$800	$900	$700
SE	$750	$875	$600
IIX	$2,700	$3,250	$2,000
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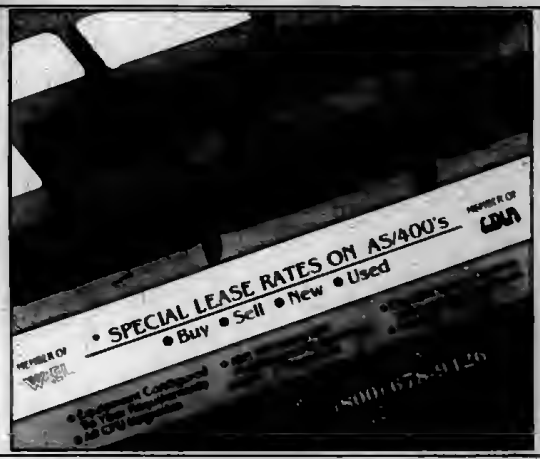

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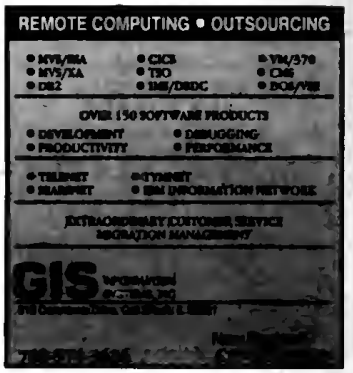

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STOCK TRADING INDEX

Industry Almanac

NEW COVERAGE

Electronic Data Systems Corp. Shearson Lehman Brothers, Inc. initiated coverage of EDS, which trades as General Motors Corp. Class E stock (GME), with a rating of outperform. The company's non-General Motors business topped $3.7 billion in 1991, and Shearson expects it to grow 20% to 25% this year. The outsourcing market in which EDS competes racked up sales of $106 billion last year and could grow more than 15% annually during the next three years, according to David Readerman, a Shearson analyst. The earnings outlook for the company is strong, as EDS controls some of the largest outsourcing contracts signed to date, he said, predicting that EDS will sign new deals this year worth a total of approximately $6 billion.

Lotus Development Corp. Prudential Securities, Inc. recently tagged Lotus (LOTS) a buy but cautioned that the stock is risky right now. Lotus is the dominant spreadsheet supplier, but it is also entering fast-growing, competitive markets, said Gibbs Moody, a Prudential analyst. However, the company's cross-platform strategy should help protect its spreadsheet flank, he said. Groupware, which contributed $41 million to Lotus' 1991 total sales of $829 million, could represent more than $300 million in revenue for the company by 1994, according to Moody. Lotus will inevitably go up against **Microsoft Corp.** (MSFT) and **Borland International, Inc.** (BORL) in the groupware ring, but Lotus has two years of experience behind it and faces little competition right now, he added.

RECOMMENDATION CHANGES

DOWNGRADED FROM STRONG BUY TO BUY: **Dell Computer Corp.** (Alex. Brown & Sons, Inc.). Dell's (DELL) current market share-capture strategy and its return-on-sales goal of 5% to 6% cannot be achieved simultaneously. Profit projections for the 1993 and 1994 fiscal years were cut, but sales expectations have increased. Recent products announced by **Compaq Computer Corp.** (CPQ) should motivate Dell to focus more on market share goals instead of its operating model. Dell will likely try to rev up revenue momentum with Gemini, a low-end product line priced 10% to 20% below Compaq's latest offerings. Gemini boxes are expected out soon.

LISA DAVIDSON and KIM S. NASH

Computerworld Weekly Stock Ticker

CLOSING PRICES THURSDAY JULY 2, 1992

TOP PERCENT GAINERS

Artel Communication Corp	44 44
Information Resources (L)	31 33
Cambex Corp	31 11
Data Switch Corp	30 00
Octel Communications Corp	22 45
Dataram Corp	20 21
Oracle Corp *	18 42
Group I Software	17 74

TOP PERCENT LOSERS

Easel Corp	-59 76
Quarterdeck Office Sys (L)	-53 41
Network General	-50 00
Software Publishing Corp	-30 38
Sequoia Systems Inc (L)	-28 57
Mentor Graphics (L)	-26 57
AtiCorp	-21 05
Microcom Inc	-18 75

TOP DOLLAR GAINERS

Matsushita Electronics	6 50
Information Resources (L)	5 88
Progress Software Corp	5 50
Policy Management Sys	4 13
Octel Communications Corp	4 13
Cambex Corp	3 50
Novell Inc *	3 25
Southwestern Bell Corp	3 13

TOP DOLLAR LOSERS

Easel Corp	-12 25
Network General	-9 25
Quarterdeck Office Sys (L)	-5 88
Software Publishing Corp	-3 88
Mentor Graphics (L)	-3 00
Filenet Corp	-2 75
Sequoia Systems Inc (L)	-2 50
Sungard Data Systems (H)	-2 25

Communications and Network Services — Up 1.71%

Exch	52-Week			July 2 Close	Wk Net Change	Wk Pct Change
OTC	15 00	6 75	3COM Corp *	10 50	-0 25	-2 33
NYS	65 75	56 25	American Info Techs Corp *	64 00	1 13	1 78
NYS	44 63	32 88	AT&T *	43 88	2 00	4 78
OTC	4 25	1 00	Ariel Communication Corp	1 63	0 50	44 44
NYS	50 63	40 25	Bell Atlantic Corp	44 75	0 25	0 56
NYS	52 63	43 38	Bellsouth Corp	48 75	0 88	1 79
NYS	7 63	4 63	Bolt Beranek & Newman	4 63	-0 13	-2 63
NYS	65 88	38 63	Cabletron Systems	48 50	1 50	3 19
OTC	31 00	12 75	Chipcom Corp	25 50	1 13	4 62
OTC	48 50	15 38	Cisco Systems Inc	47 75	2 88	6 41
OTC	35 25	12 75	Compression Labs Inc	13 00	-0 38	-2 80
OTC	3 38	1 69	Data Switch Corp	3 63	0 38	30 00
NYS	25 63	12 38	Digital Comm Assoc *	17 75	-0 25	-1 39
OTC	17 75	8 50	Digital Systems Int'l Inc	8 75	-0 25	-2 78
OTC	7 38	3 63	DSC Communications	4 63	0 00	0 00
OTC	10 88	4 75	Fibronix Int'l Inc	5 00	0 13	2 44
OTC	37 50	13 75	Filenet Corp	16 50	-2 75	-12 36
OTC	3 38	1 13	Gandalf Technologies Inc	2 56	-0 06	-2 38
OTC	2 50	0 88	Gateway Communications (L)	1 00	0 13	14 25
NYS	5 50	2 13	General Datacomm Inds	3 63	0 13	3 57
ASE	5 88	0 50	Go Video	2 75	0 00	0 00
NYS	35 00	28 13	GTE Corp *	32 00	0 25	0 75
NYS	70 63	50 00	ITT Corp	64 88	0 75	1 17
OTC	36 13	25 25	MCI Communications Corp	32 25	0 13	0 39
OTC	14 50	6 00	Microcom Inc	8 50	-1 63	-15 75
NYS	18 25	8 63	Network Equipment Tech *	10 63	-0 75	-6 59
OTC	25 50	8 75	Network General	9 25	-9 25	-50 00
OTC	20 00	8 50	Network Systems Corp	10 88	1 00	10 13
OTC	7 88	4 50	Newbridge Network's Corp	16 13	-0 13	-0 77
NYS	49 25	34 13	Northern Telecom Ltd *	37 00	1 50	4 23
OTC	65 00	23 88	Novell Inc *	53 75	3 25	6 44
NYS	82 38	69 13	Nynex Corp *	79 38	2 63	3 42
OTC	37 50	16 50	Octel Communications Corp	22 50	4 13	22 45
OTC	8 88	4 50	Penril Data Comm Ntwks	4 50	-0 38	-7 69
OTC	53 00	25 00	Picturetel Corp	25 25	-0 38	-1 46
OTC	18 75	10 00	Proteon Inc	11 00	0 25	2 33
NYS	24 00	11 63	Scientific Atlanta Inc	25 38	0 88	3 89
NYS	68 00	51 50	Southwestern Bell Corp	62 88	3 13	5 23
NYS	30 00	20 75	Sprint Corp	21 88	0 38	1 74
OTC	36 25	14 25	Synoptics Communications	30 25	0 75	2 84
NYS	38 88	32 88	US West Inc	35 88	1 00	2 87
OTC	41 25	21 25	Wellfleet Communications	25 25	1 00	3 54

PC and Workstations — Up 3.40%

OTC	15 25	4 75	Advanced Logic Research (L)	5 25	0 50	10 53
OTC	70 00	41 75	Apple Computer Inc *	66 25	0 75	1 15
OTC	32 25	12 00	AST Research Inc * (L)	13 88	1 00	7 77
NYS	19 25	6 50	Commodore Int'l (L)	10 13	0 63	6 58
NYS	37 50	22 13	Compaq Computer Corp *	24 63	1 00	4 23
OTC	29 00	13 91	Dell Computer Corp	17 75	0 88	5 19
OTC	7 75	3 00	Everex Systems Inc	3 25	-0 13	-3 70
NYS	34 00	21 25	Harris Corp	27 75	0 63	2 30
NYS	85 00	44 63	Hewlett-Packard Co *	68 88	1 50	2 19
OTC	16 50	7 38	Mips Computer Systems	9 75	0 13	1 45
NYS	29 75	14 38	Silicon Graphics	17 50	1 13	6 87
OTC	35 88	20 75	Sun Microsystems Inc *	28 13	3 00	12 97
NYS	31 25	23 25	Tandy Corp *	23 25	1 00	4 12
NYS	11 13	5 13	Zenith Electronics	7 50	0 25	3 45
OTC	25 50	5 25	Zeos International Ltd	6 25	-0 13	-1 96

Large Systems — Off 1.61%

ASE	20 63	11 63	Amdahl Corp *	17 63	1 00	6 02
NYS	14 00	7 50	Control Data Corp	13 75	0 00	0 00
NYS	18 38	8 88	Cumnes Computer	8 88	-0 50	-5 78
OTC	19 83	2 88	Cray Computer	3 13	0 00	0 00
NYS	52 25	27 38	Cray Research Inc * (L)	25 00	1 38	4 96
NYS	22 50	7 13	Data General Corp	7 63	-0 13	-1 61
NYS	73 75	33 75	Digital Equipment Corp * (L)	33 63	-0 88	-2 54
NYS	106 38	81 63	IBM *	96 88	-0 38	-0 38
NYS	127 50	93 50	Matsushita Electronics	109 50	6 50	6 31
OTC	19 75	9 50	Pyramid Technology	10 75	-0 50	-4 44
OTC	17 88	7 50	Sequent Computer Sys	15 13	0 25	1 68
OTC	18 38	6 25	Sequoia Systems Inc (L)	6 25	-2 50	-28 57
NYS	94 25	28 75	Stratus Computer Inc *	43 00	1 88	4 56
NYS	15 13	9 50	Tandem Computers Inc *	11 25	1 00	9 76
OTC	3 44	1 13	Transtech Corp	1 31	0 06	5 04
NYS	11 75	3 38	Unisys Corp *	8 75	0 00	0 00
ASE	7 50	2 00	Wang Labs Inc (b)*	3 50	0 13	3 45

Software — Off 0.09%

OTC	66 50	37 50	Adobe Systems Inc	44 75	2 50	8 92
OTC	13 25	3 50	Al Corp	3 75	1 00	21 05
OTC	45 50	11 50	Aldus Corp	13 00	0 88	7 22
OTC	19 75	10 13	American Software Inc	12 88	0 63	5 10
OTC	19 00	7 50	Ask Computer Systems	11 75	0 75	6 82
OTC	57 25	23 25	Autodesk Inc	37 13	0 63	1 71
OTC	37 75	8 25	Bachman Info Systems	10 50	1 50	16 67
OTC	42 50	25 00	BGS Systems Inc	38 75	0 50	1 30
OTC	37 50	37 25	BMC Software Inc	42 00	2 50	6 33
OTC	20 50	9 00	Boole & Babbage	17 00	-0 13	-0 73
OTC	88 75	37 75	Borland Int'l Inc * (L)	41 00	1 38	3 47
OTC	11 25	4 38	CE Software (L)	4 50	-0 13	-2 70
ASE	14 38	8 50	Cheyenne Software Inc	12 13	0 38	3 19
OTC	20 38	7 25	Cognos Inc	9 13	1 00	12 31
OTC	17 00	7 50	Computer Associates *	12 00	0 88	7 87
OTC	21 50	8 25	Cornerstone Inc	10 25	0 25	2 50
OTC	47 88	8 25	Easel Corp	8 25	-12 25	-59 75
OTC	19 50	8 25	Goal Systems Int'l	16 88	1 13	7 14
OTC	25 50	11 50	Group I Software	18 25	2 75	17 74
OTC	6 63	3 50	Hogan Systems Inc (L)	4 00	0 38	10 34
OTC	36 25	16 50	Information Resources (L)	24 63	5 88	31 33
OTC	36 00	5 50	Informix Corp	26 00	1 75	8 42
OTC	3 63	1 06	Intellicorp Inc	1 38	-0 25	-15 38
OTC	27 75	13 50	Intergraph Corp (L)	13 50	-1 00	-6 90
OTC	15 00	4 88	Interleaf Inc	8 25	-1 63	-16 46
OTC	20 25	8 50	Intersolv Inc	12 25	-0 50	-3 92
OTC	30 00	10 50	Knowledgeware Inc	11 88	0 00	0 00
OTC	45 25	30 25	Legent Corp *	32 50	1 88	6 12
OTC	40 75	17 75	Lotus Development * (L)	18 25	0 50	2 82
OTC	7 38	2 38	Mesa Software	2 88	0 19	6 96
OTC	22 25	7 50	Mentor Graphics (L)	7 50	-3 00	-25 57
OTC	20 50	6 50	Micrografx Inc	14 75	0 25	1 72
OTC	88 84	40 34	Microsoft Corp *	69 88	3 13	4 68
OTC	21 13	7 88	Oracle Corp *	16 88	2 63	18 42
OTC	41 25	12 00	Parametric Technology	36 75	2 25	6 52
OTC	11 00	4 13	Phoenix Technologies	4 13	-0 13	-2 94
OTC	25 25	9 63	Platinum Technology	14 25	0 75	5 56
OTC	44 50	27 50	Progress Software Corp	38 00	5 50	16 92
OTC	26 63	5 13	Quarterdeck Office Sys (L)	5 13	-5 88	-53 41
OTC	29 50	8 75	Rasterops	10 50	0 25	2 44
OTC	17 25	6 13	Ross Systems	6 13	-1 38	-18 33
OTC	25 25	9 88	Software Publishing Corp	9 88	-4 38	-30 56
OTC	9 50	2 00	Software Toolworks Inc	2 38	0 31	16 12
OTC	7 25	1 75	Spinnaker Software	3 13	0 13	4 17
OTC	16 50	8 25	State of the Art	7 75	-0 50	-6 06
NYS	25 25	11 38	Sterling Software Inc	16 00	1 50	10 34
OTC	30 00	13 00	Struct Dynamics Research	14 00	-0 50	-3 45
OTC	31 75	15 00	Sybase Inc	25 75	2 75	11 96
OTC	51 00	21 88	Symantec Corp	37 50	2 38	6 78
NYS	15 50	8 50	Systems Center Inc * (L)	8 50	-0 88	-11 86
OTC	34 25	9 88	System Software Assoc	29 50	1 50	5 36
OTC	23 75	15 00	Walker Interactive Systems(L)	17 25	0 50	2 99
OTC	6 63	2 13	Wonderlist	2 50	-0 13	-4 76

Semiconductors — Up 1.50%

NYS	21 50	7 75	Advanced Micro Devices	7 75	-1 00	-11 42
NYS	11 13	7 00	Analog Devices Inc	9 75	0 25	2 63
OTC	15 13	8 75	Atmel Corp	8 50	-0 25	-2 86
OTC	14 13	8 38	Chips and Technologies	8 63	-0 63	-6 77
NYS	22 63	9 38	Cypress Semiconductor Corp	8 38	-0 13	-1 47
NYS	9 75	6 25	Dallas Semiconductor	9 13	0 88	10 61
OTC	68 75	38 50	Intel Corp *	58 88	0 63	1 13
NYS	9 88	5 88	LSI Logic Corp (L)	6 75	0 75	12 50
OTC	21 50	11 13	Microchip Technology	14 13	-0 13	-0 88
NYS	83 75	54 00	Motorola Inc *	75 63	0 38	0 49
NYS	11 50	3 88	National Semiconductor *	8 50	0 75	9 57
OTC	27 00	12 75	Sierra Semiconductor	13 88	0 13	0 91
OTC	40 50	25 00	Texas Instruments *	38 00	1 50	4 05
OTC	10 50	5 88	VLSI Technology	6 88	-0 25	-3 51
OTC	12 50	3 38	Weitek	3 38	0 00	0 00
ASE	5 63	2 00	Western Digital Corp	4 75	0 50	11 76
OTC	32 50	17 25	Xilinx (L)	19 25	2 00	11 59
OTC	11 50	4 63	Zilog Inc	7 25	0 00	0 00

Peripherals and Subsystems — Up 5.27%

OTC	2 00	1 00	Apertus Technologies	1 56	0 06	4 20
OTC	10 25	2 75	Archive Corp	3 50	0 25	8 26
OTC	24 50	11 25	Banctec Inc	22 13	-0 38	-1 67
OTC	23 50	6 00	Cambex Corp	14 75	3 50	31 11
ASE	17 50	7 00	Cognitronics Corp	16 25	0 63	4 00
NYS	23 88	12 50	Conner Peripherals *	17 63	-0 75	-4 08
ASE	16 88	3 34	Dataram Corp	14 13	2 38	20 21
NYS	18 63	4 88	EMC Corp	17 50	1 63	10 24
OTC	8 38	4 75	Emulex Corp	7 13	0 38	5 56
OTC	23 00	14 50	Evans & Sutherland (L)	15 00	0 00	0 00
OTC	40 63	13 38	Exabyte	25 25	0 25	0 99
OTC	27 25	15 75	Intelligent Info. Systems	23 38	1 38	6 25
OTC	11 25	4 00	Iomega Corp	5 75	0 25	4 55
OTC	34 75	14 50	IPL Systems Inc	16 88	0 13	0 67
OTC	24 50	11 75	Komag Inc	13 00	0 38	2 97
OTC	14 00	1 63	Maxtor Corp *	10 00	1 13	12 68
OTC	12 63	5 50	Micropolis Corp	8 50	0 50	6 25
NYS	98 75	83 50	3M Co	96 00	0 38	0 39
NYS	8 75	3 50	Pomeroy Inc	5 00	-0 25	-4 76
NYS	26 75	8 13	QMS Inc	8 25	-0 25	-2 94
OTC	16 00	6 88	Quantum Corp	13 63	0 75	5 83
OTC	12 25	5 13	Radius Inc	11 50	1 00	9 52
OTC	12 88	5 88	Recognition Equipment	8 50	0 25	3 03
OTC	13 13	5 38	Rexon Inc	10 00	1 00	11 11
OTC	17 83	7 25	Seagate Technology *	14 50	0 00	0 00
NYS	75 00	28 63	Storage Technology * (L)	30 63	1 50	5 15
OTC	21 88	10 00	Tektronix Inc	17 75	0 63	3 66
NYS	82 25	52 63	Xerox Corp	69 75	1 88	2 75

Services — Up 1.71%

OTC	18 00	11 66	American Mgmt Systems *	18 00	2 50	16 13
NYS	5 38	2 00	Analogic Inc	3 63	0 00	0 00
OTC	18 00	12 25	Analysts Int'l	16 50	0 00	0 00
NYS	46 00	30 25	Auto Data Processing *	42 75	0 50	1 18
NYS	24 18	12 50	Comdisco Inc *	15 50	0 88	5 98
OTC	9 75	5 75	Computer Horizons	8 75	-0 25	-2 78
NYS	84 88	52 25	Computer Sciences *	62 38	1 00	1 63
NYS	10 13	7 00	Computer Task Group	8 00	-0 25	3 03
OTC	18 25	7 75	Corporate Software	9 75	-0 25	-2 50
OTC	30 75	12 75	Egghead Discount Software	17 25	0 88	5 34
NYS	33 06	23 19	General Motors E (EDS) *	25 38	1 25	4 52
OTC	30 38	6 25	Intelligent Electronics (L)	7 50	0 13	1 69
OTC	14 88	2 50	Mentor	8 63	-0 50	-4 94
OTC	15 75	5 75	Microage Inc	10 75	0 50	4 88
OTC	27 50	13 50	Paychex	24 00	2 00	9 09
NYS	73 00	47 25	Policy Management Sys	64 88	4 13	6 79
NYS	43 50	19 63	Reynolds and Reynolds	38 25	-0 88	2 36
OTC	32 00	21 25	SEI Corp	23 13	0 88	3 93
OTC	30 38	16 88	Shared Medical Systems	18 13	0 13	0 69
OTC	26 25	13 50	Sungard Data Systems (H)	23 25	-2 25	-9 22
NYS	4 88	1 13	Ultimate Corp	1 63	0 13	7 14

KEY (H) – New annual high reached in period (L) – New annual low reached in week

* Companies tracked in Computerworld Stock Index

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IN BRIEF

Toshiba, IBM align

■ **IBM** and **Toshiba Corp.** last week confirmed that they will take on **Intel Corp.** by jointly developing solid-state storage devices using flash memory chips. Under the agreement, the companies will collaborate on design but will independently assemble and market their own devices.

■ **Oracle Corp.** last week continued restructuring its upper management. Geoffrey Squire, who had been president of Oracle's worldwide distribution sales organization since 1990, was named chief executive officer of Oracle International Operations. Oracle also hired Anthony Craig, a former CEO of Prime Computer, Inc., as senior vice president of its Intercontinental Division, where he reports to Squire. Robert Shaw, a former Booz Allen & Hamilton managing partner, was named senior vice president of Oracle's Consulting Group. He will report to recently named Oracle USA President Ray Lane.

■ Richard Smith, a senior information systems executive at **American Express Travel Related Services Co.**'s technology center in Phoenix, was fired a few days after the **IBM** sales executive who called on his account was terminated. Neither firm would comment on whether the firings were related. An Amex spokesman, however, said Smith's departure followed an investigation into his outside business dealings.

■ **Next, Inc.** last week said it has obtained additional financing in the form of a $55 million credit line from investor **Canon, Inc.** and a $10 million credit line from Chairman Steve Jobs. Funds borrowed on these lines would be converted to equity if and when Next goes public.

Hopes high despite second-quarter woes

BY KIM S. NASH
CW STAFF

Dour second-quarter earnings statements have not shattered Wall Street's hopes for a late 1992 recovery, but they clearly have some industry pundits worried. Several companies last week either warned of worse-than-expected quarterly results or reported outright bad news.

Following Lotus Development Corp.'s disclosure that its second quarter would not meet earlier expectations [CW, June 29], software developers such as Easel Corp. and Software Publishing Corp., networking vendor Network General Corp. and chip maker Advanced Micro Devices, Inc. warned investors of their own fiscal second-quarter woes.

"It's not great, but not hopeless. And it sure beats last quarter," said Randy Brandow, a vice president at Duff & Phelps Investment Research Co. in Chicago, of the latest round of financial results.

Large systems vendors are expected to fare better, compared with the monumental losses recorded late last year. New orders for Enterprise System/9000 mainframes — still the bread and butter of IBM's balance sheet — are expected to boost that company's bottom line despite the industry buzz about user downsizing, according to Curt Rohrman, an analyst at First Boston Corp. "Companies that run high-end mainframes are not scrapping them," Rohrman said.

Meanwhile, IBM's Application System/400 minicomputer line will coast with about 5% sales growth this year and no more until a new product cycle starts. This is expected in mid- to late 1993, he added.

Reorganization efforts have thus far had little impact on either IBM or Digital Equipment Corp., but results are likely to appear later this year.

Analysts generally agreed that things will improve throughout the industry in 1992's latter half. The fourth quarter is likely to shine as users run through the money that remains in their annual IS budgets, they predicted.

Financial results for the quarter just ended, however, will continue to fall short of the lofty expectations set early in 1992, particularly in the personal computer arena.

The culprit? Price wars, according to John Girton, vice president of research at Van Kasper & Co., a brokerage firm in San Francisco.

PC makers can cut prices for only so long before bottom lines are seriously hurt, Girton said. That is what hit Dell Computer Corp. this quarter, and that's what Compaq Computer Corp. is, in part, rebounding from, he explained.

Compaq's first-quarter sales of $45 million, reported in April, were a 60% free-fall from those of a year ago, and the current quarter looks similar. The company said restructuring costs and aggressive price-cutting will dig into profits for this quarter and next quarter.

Steven Eskenazi, an analyst at Alex. Brown & Sons, Inc. in New York, reduced earnings estimates for Dell, citing heavy pressure from Compaq's latest low-priced offerings.

What the market needs to spur sales, Girton said, is "something more exciting than cheaper and faster models. Price wars kill innovation."

Squeezed margins are not a PC hardware-only phenomenon. Software Publishing expects to report a loss or break-even results for its fiscal third quarter, which ended last week. The PC applications maker said a slowing DOS market and scorching competition among Microsoft Corp. Windows-based products eroded profit margins in recent months.

Not so at Microsoft. Users have snapped up Windows 3.1, Excel 4.0 and Word for Windows at a fast clip, leaving Microsoft likely to surpass earnings estimates again this quarter, Brandon said.

Those products — out on time and in good shape — helped the company bag its quarter even before it started, he said. "You don't stop a runaway freight train."

Another high note was Oracle Corp., which closed out fiscal 1992 with sales of $1.2 billion, up 15% from last year. Profits jumped to $61.5 million from a 1991 loss of $12.4 million.

"The fourth quarter was strong and probably more of what we expect of our business in 1993," said Michael Musson, Oracle's director of investor relations. "We're seeing good growth in our Unix and desktop businesses," he added.

However, IBM mainframe license sales coasted at $22 million in the fourth quarter of 1992, even with 1991's last quarter. Quarterly sales of DEC VAX versions of Oracle's relational database — once the mainstay of Oracle sales — fell to $43 million from $49 million in 1991.

Easel, meanwhile, said it would report a loss. It blamed an inadequate sales staff and a blurred product message.

"We have been repositioning the company as a provider of client/server development tools, and it has taken us longer to reach the market with this message than anticipated," said Doug Kahn, president and chief executive officer.

Senior West Coast editor Jean S. Bozman contributed to this report.

Rocky road

Sales at some companies are expected to increase from last year at this time but decrease significantly compared with last quarter — with a few exceptions:

	1992 calendar second-quarter sales	1991 calendar second-quarter sales	Year-to-year increase	1992 calendar first-quarter sales	Quarter-to-quarter change
AMD	$346.3M*	$296.8M	17%	$407.4M	(15)%
Easel	$6.7M to $7.4M**	$6.4M	5% to 16%	$8.2M	(18)% to (20)%
Intersolv	$23.9M	$15.7M	53%	$21.6M	11%
Network General	$1.5M**	$13M	15%	$19M	(21)%
Oracle	$360M	$287M	25%	$290M	24%
Software Publishing	$34M to $36M	$31.9M	7% to 13%	$43.6M	(17)% to (22)%

*Projected **Will report July 9 ***Will report July 20

Banyan plans stock offering of $10 to $12 per share

BY JOANIE M. WEXLER
CW STAFF

WESTBORO, Mass. — After years of false starts, networking software vendor Banyan Systems, Inc. last week said it has filed a registration with the Securities and Exchange Commission for an initial public offering (IPO) of 2.7 million shares of its common stock with an estimated per-share price of $10 to $12.

Banyan customers have been pushing the company to go public or he acquired in order to gain the resources it needs to enrich its Vines network operating system and grow market share. Industry observers historically have pointed to both timing issues surrounding Banyan management upheavals and market conditions aa the barriers that have prevented the IPO from going forward before now.

However, with A. Peter Hamilton named Banyan president just one month ago, and the software IPO investment climate less than optimum, it is not clear that Banyan has found an especially opportune time for the move now.

David Wu, an investment analyst at S. G. Warburg & Co. in New York, said he suspects the main reason for Banyan's move in a "crummy environment" is competitor Novell, Inc.'s forthcoming NetWare 4.0 release, which is slated to include global naming services — Banyan's current claim to fame.

"Going public now would help because more cash on the balance sheet gives customers a better feeling that you're going to be around" in the face of new competition, Wu said.

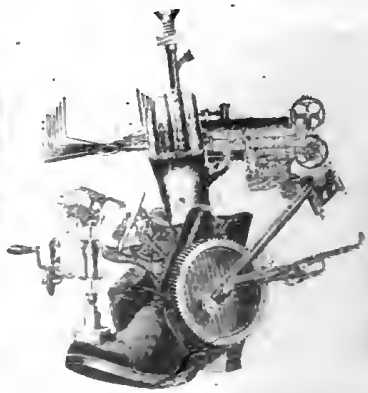
Tongue twisting

Harry Hacker hacked a hunk of hard-locked hex code.
If Harry Hacker hacked a hunk of hard-locked hex code,
how many hunks of hard-locked hex code did Harry Hacker hack?
(repeat three times)

beige toaster *n.*
A Macintosh computer.
digit *n.*
An employee of Digital Equipment Corp.
IBM discount *n.*
A price increase.
troglodyte mode *n.*
Programming with the lights turned off, sunglasses on and the terminal inverted (black on white) because you've been up so many days straight that your eyes hurt. Loud music blaring from a stereo is optional but recommended (see larval stage).

Signals to
a modern Paul Revere:
1 if by LAN
2 if by C
3 if by Unix

What do you call someone who really understands the difference between NetWare and Vines?
The Wizard of NOS



The next thing in portables

Beta Shoe Co.'s Software Engineering Division today announced Compu-toe, a 6-ounce insert for steel-toed work boots. "It will blow your socks off!" a Beta Shoe spokesman said.

The Compu-toe packs the thrust of a 486 desktop and comes with an advanced OOPS interface that is invoked by simply walking around and kicking objects. Filing cabinets and garbage cans can be accessed intuitively with a single swift kick.

The vendor claims that Compu-toe was designed for difficult situationa that do not respond readily to conventional desktop computing. Employee motivation programs, font-rich office newsletters, three-dimensional spreadsheets and federally funded recycling programs are cited as examples.

Basic commands are executed by simple foot movements, leaving the user's hands free for virtually any purpose. Parallel processing is readily achieved with a pair of Compu-toes and a reasonable level of sobriety. Advanced users are said to benefit from tango lessons.

Compu-toe offers 4M bytes of on-sole RAM. Data compression hardware is standard. An optional step-on bar-code reader can read crushed beer cans. There are also plans for the introduction of a track-shoe-ball later this year.

From **Walter Frey**
Senior manager, systems research and development
Alberta Treasury
Edmonton, Alberta

Do you have anecdotes about your users, your boss or your job? Know any industry trivia? If so, please contact Lory Zottola or Jodie Naze at (800) 343-6474. If we use your ideas, we'll send you a gift.

Sources: Mt. Xinu, Inc., Berkeley, Calif.; The New Hacker's Dictionary (The MIT Press)

WYSIWYG design and illustration Tom Monahan

INSIDE LINES

Making music

▶ Strange bedfellows will be hosting a bash this week at the Win32 Professional Developers Conference in San Francisco. Archrivals Microsoft and Borland will pool hors d'oeuvre budgets along with a mutual competitor of theirs, database vendor Oracle. For Borland and Microsoft, which compete viciously in several software arenas, the friendliness symbolizes a shared need to promote Borland's C++ compiler and Microsoft's Windows NT operating system (see story page 14). Borland Chairman Philippe Kahn's omnipresent Turbo Jazz band is billed as the entertainment, sans Kahn, who will be in Japan, according to one Borland source. Borland is seeking replacement players from Microsoft.

Sign of the times

▶ Client/server is gaining mind share at the Transaction Processing Council (TPC), a benchmarking group that is widely used by midrange and workstation hardware and software vendors. Beginning July 15, the TPC will require vendors publishing TPC results to designate whether they ran tests in a client/server or a host configuration. This is good news for vendors of proprietary host systems, which have complained that the lack of such a designation has benefited the client/server camp. In a related undertaking, the TPC said it expects to offer client/server-specific benchmarks within the year.

Marketing 101

▶ A source close to IBM said Big Blue can make its Intel-approved SLC clone for about $5 more than an 80386SX costs to produce. Our source wonders why IBM charges $530 more for a Model 57SLC than for a similarly configured 57SX, when lower SLC pricing might give users a reason to buy the machines and boost IBM's market share. An IBM spokesman declined to comment on specific chip pricing other than to say that IBM makes the SLC at a cost-competitive price. He added that the SLC offers more performance than the SX and thus should cost more.

Different strokes

▶ DEC last week quietly cut prices on many of its PCs by as much as 25%, but sources said that was a long-planned action. Reports are that DEC will lop prices still further next week as a rebuttal to the current tag-slashing frenzy touched off by Compaq's blitz. Along the same lines, AST will not be cutting prices, chiefly because the company expects to have totally revamped its line by the end of next month.

Dirty electronic tricks

▶ An interloper posing as a Perot spokesman recently posted an address box on CompuServe, we hear. One correspondent tipped off the campaign after the impostor's answers made him sound a little suspicious. Campaign spokesmen denied a connection, and the on-line address disappeared shortly thereafter.

At your service

▶ Apple Chairman John Sculley noted recently that Kaleida could be used for both Apple and IBM to make a foray into the information services industry. He called the creation of a national information network key to their future: "IBM and Apple do not feel constrained to just be in [information] products. Both companies at this time are looking at getting into information services." Sculley said Apple and IBM could move into information services separately as well.

Only a year after Apple shelled out $26.5 million to settle a suit brought by The Beatles over the name "Apple," the company may be facing another trademark fight. This year's offender: Newton. Those in the industry may remember it as the moniker of an upcoming handheld personal computer device from Apple, but the rest of the world knows it as a fig cookie made by the Nabisco Foods Group. Nabisco spokesman Mark Gutshce said the company has held a trademark on "Newton" for 101 years, adding, "We are very protective of our trademark . . . and we have been known to be very aggressive in protecting our rights." Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's 24-hour voice-mail tip line at (508) 820-8555.

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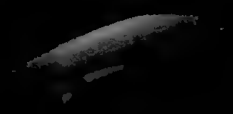

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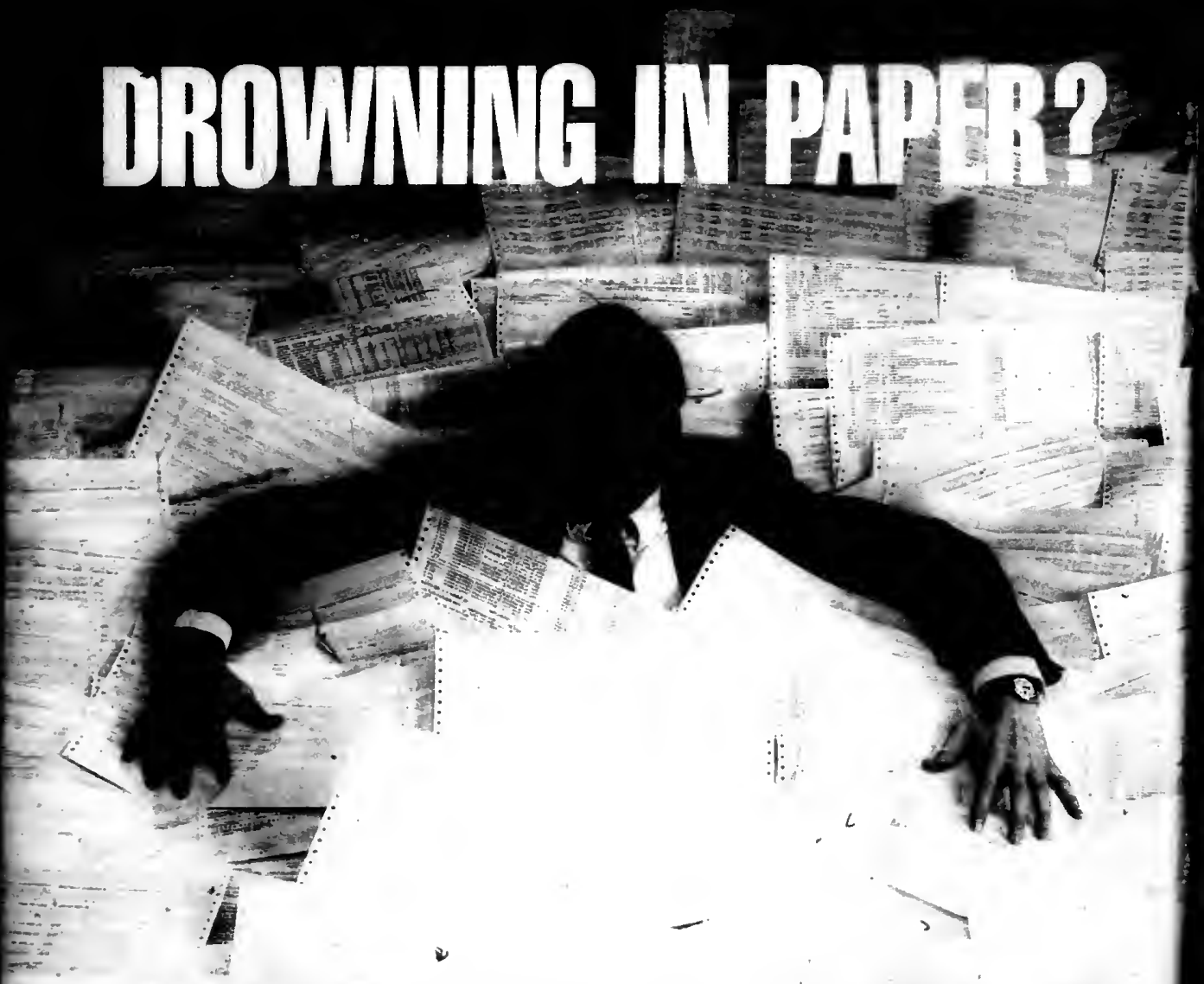
DROWNING IN PAPER?



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